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MAY 1999

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# DELL'S ALL STAR CAST.

## DELL DIMENSION® V400c INTEL® CELERON® PROCESSOR 400MHz

- 128KB Single Bank Pipeline Burst Cache
- Intel® 440BX AGPset
- 128MB Single Bank Pipeline Burst Cache
- 32MB 100MHz SDRAM
- 4.3GB Ultra ATA Hard Drive
- ATI® 8MB 3D 2X AGP Integrated Graphics
- Yamaha 64 Voice Wavetable Integrated Sound
- Harman Kardon HK195 Speakers
- 15" Colour Monitor (13.7" v.i.s.)
- Microsoft® IntelliMouse®
- Microsoft® OEM Works Suite 99
- 3Com® USR 56K Capable V90 PCI WinModem

**\$1,989\***  
plus delivery

or \$17 per week\*\*

Upgrade options include:

- 64MB 100MHz SDRAM \$97
- 6.4GB Ultra ATA Hard Drive \$39
- Call for a complete range of upgrades

## DELL DIMENSION® DESKTOPS – SMALL BUSINESS SYSTEMS

### COMMON FEATURES

- Mini Tower Chassis
- 3.5" 1.44MB Diskette Drive
- Microsoft® Windows® 98

### NEW DELL DIMENSION® XPS T500 NEW INTEL® PENTIUM® III PROCESSOR 500MHz

- 512KB Single Bank Pipeline Burst Cache
- 128MB 100MHz SDRAM
- 13.6GB Ultra ATA Hard Drive
- 3Com® 3C905B TXM 10/100 WuOL NIC
- 8MB ATI® EXPERT 980 3D AGP Graphics Card
- Yamaha 64 Voice Wavetable Integrated Sound
- 40X Variable EIDE CD-ROM Drive
- Harman Kardon HK195 Speakers
- 17" Colour Monitor (13.7" v.i.s.)
- Microsoft® IntelliMouse®
- Microsoft® OEM Office 97 Small Business Edition
- Iomega Zip 100MB Internal Drive

### DELL DIMENSION® XPS T450 NEW INTEL® PENTIUM® III PROCESSOR 450MHz

- 512KB Single Bank Pipeline Burst Cache
- 128MB 100MHz SDRAM
- 9.1GB Ultra ATA Hard Drive (7,200 rpm)
- 3Com® 3C905B TXM 10/100 WuOL NIC
- 8MB ATI® EXPERT 980 3D AGP Graphics Card
- Yamaha 64 Voice Wavetable Integrated Sound
- 40X Variable EIDE CD-ROM Drive
- Harman Kardon HK195 Speakers
- 17" Colour Monitor (15.9" v.i.s.)
- Microsoft® IntelliMouse®
- Microsoft® OEM Office 97 Small Business Edition

- McAfee Virus Scan
- 3 Year Limited Warranty
- Free Lifetime Telephone Technical Support

### NEW DELL DIMENSION® V433c INTEL® CELERON® PROCESSOR 433MHz

- 128KB Single Bank Pipeline Burst Cache
- Intel® 440BX AGPset
- 64MB 100MHz SDRAM
- 6.4GB Ultra ATA Hard Drive
- Integrated Intel® 10/100 PCI Ethernet Controller
- ATI® 8MB 3D 2X AGP Integrated Graphics
- 32X Variable EIDE CD-ROM Drive
- 15" Colour Monitor (13.7" v.i.s.)
- Microsoft® IntelliMouse®
- Microsoft® OEM Works Suite 99

## DELL® INSPIRON® 7000 A333GT INTEL® PENTIUM® II PROCESSOR 333MHz

- 64MB SDRAM
- 4.3GB Ultra ATA Hard Drive
- 8MB ATI® RAGE LT PRO 2X AGP Video Controller
- High-fidelity Audio SoundBlaster Compatible
- 24X Variable CD-ROM Drive
- 14.1" XGA Colour TFT Display
- Microsoft® OEM Works Suite 99

**\$4,829\***  
plus delivery

or \$40 per week\*\*

Upgrade options include:

- 6.4GB Ultra ATA Hard Drive \$194
- 4X DVD-ROM Drive and Internal Decoder Card \$331
- Call for a complete range of upgrades

## DELL® POWEREDGE® SERVERS

### COMMON FEATURES

- 512KB Internal Cache
- 3.5" 1.44MB Diskette Drive

- 3 Year Limited Warranty
- Free Lifetime Telephone Technical Support

### ADVANCED WORKGROUP SERVER

### DELL® POWEREDGE® 2300 SERVER INTEL® PENTIUM® II PROCESSOR 400MHz (DUAL PROCESSOR CAPABLE)

- Rack-mount Capable Mini Tower (Midnight Grey)
- 64MB 100MHz SDRAM with ECC (Upgradeable to 1GB)
- 4GB LVD SCSI Hard Drive (6 Internal Bays)
- Standard Intel® Pro 100+ NIC
- Integrated Ultra2/LVD and Ultra/Narrow SCSI Controllers
- 32X Variable SCSI CD-ROM Drive
- 15" Colour Monitor (13.7" v.i.s.)
- Standard Openview Network Node Manager S.E.

### VALUE WORKGROUP SERVER

### DELL® POWEREDGE® 1300 SERVER INTEL® PENTIUM® II PROCESSOR 400MHz (DUAL PROCESSOR CAPABLE)

- Mini Tower (Midnight Grey)
- 64MB 100MHz SDRAM with ECC (Upgradeable to 1GB)
- 4GB LVD SCSI Hard Drive
- Standard Intel® Pro 100+ NIC
- Integrated Ultra2/LVD SCSI Controller
- 32X Variable EIDE CD-ROM Drive
- Standard Openview Network Node Manager S.E.

### VALUE WORKGROUP SERVER

### DELL® POWEREDGE® 1300 SERVER INTEL® PENTIUM® II PROCESSOR 350MHz (DUAL PROCESSOR CAPABLE)

- Mini Tower (Midnight Grey)
- 64MB 100MHz SDRAM with ECC (Upgradeable to 1GB)
- 4GB LVD SCSI Hard Drive
- Standard Intel® Pro 100+ NIC
- Integrated Ultra2/LVD SCSI Controller
- 32X Variable EIDE CD-ROM Drive
- Standard Openview Network Node Manager S.E.



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# INTRODUCING DE

## DELL DIMENSION® DESKTOPS – MULTIMEDIA SYSTEMS

### COMMON FEATURES

#### NEW DELL DIMENSION® XPS T500 NEW INTEL® PENTIUM® III PROCESSOR 500MHz

- 512KB Single Bank Pipeline Burst Cache
- 128MB 100MHz SDRAM
- 25GB Ultra ATA Hard Drive
- 16MB Diamond Viper TNT AGP Graphics Card
- Turtle Beach Montego II 320 Voice PCI Sound Card
- 4.8X DVD-ROM Drive and Decoder Card with TV Out
- Altec Lansing ADA-880 Full Dolby® Digital Speakers with Subwoofer
- 19" Colour Monitor (17.9" v.i.s.)
- Logitech 4 button MouseMan® Wheel (PS/2v)
- Microsoft® OEM Works Suite 99
- Power Game Pack Optimised for Intel® Pentium® III Processors
- 3Com® USR 56K Capable V.90 PCI WinModem
- Iomega Zip 100MB Internal Drive
- Microsoft® Elite Keyboard

**\$6,079\***  
plus delivery

or \$51 per week\*\*

Upgrade options include:

- 256MB 100MHz SDRAM \$389
- 21" Trinitron® Monitor (19.8" v.i.s.) \$1,001
- Call for a complete range of upgrades

#### NEW DELL DIMENSION® XPS T450 NEW INTEL® PENTIUM® III PROCESSOR 450MHz

- 512KB Single Bank Pipeline Burst Cache
- 128MB 100MHz SDRAM
- 13.6GB Ultra ATA Hard Drive (7,200 rpm)
- 16MB Diamond Viper TNT AGP Graphics Card
- Turtle Beach Montego II 320 Voice PCI Sound Card
- 4.8X DVD-ROM Drive and Decoder Card with TV Out
- Altec Lansing ACS-495 Full Dolby® Surround Sound Speakers with Subwoofer
- 19" Colour Monitor (17.9" v.i.s.)
- Microsoft® IntelliMouse®
- Microsoft® OEM Works Suite 99
- Power Game Pack Optimised for Intel® Pentium® III Processors
- 3Com® USR 56K Capable V.90 PCI WinModem
- Microsoft® Elite Keyboard

**\$4,569\***  
plus delivery

or \$38 per week\*\*

Upgrade options include:

- Iomega Zip 100MB Internal Drive \$146
- Microsoft® OEM Office 97 Small Business Edition \$278
- Call for a complete range of upgrades

#### DELL DIMENSION® V400 INTEL® PENTIUM® II PROCESSOR 400MHz

- 512KB Single Bank Pipeline Burst Cache
- 128MB 100MHz SDRAM
- 6.4GB Ultra ATA Hard Drive
- ATI® 8MB 3D 2X AGP Integrated Graphics
- Yamaha 64 Voice Wavetable Integrated Sound
- Harman Kardon HK195 Speakers
- 4.8X DVD-ROM Drive and Software Decoding
- 17" Colour Monitor (15.9" v.i.s.)
- Microsoft® IntelliMouse®
- NEW Microsoft® OEM Works Suite 99
- 3Com® USR 56K Capable V.90 PCI WinModem

**\$3,019\***  
plus delivery

or \$25 per week\*\*

Upgrade options include:

- 19" Colour Monitor (17.9" v.i.s.) \$360
- Altec Lansing ACS-495 Full Dolby® Surround Sound Speakers with Subwoofer \$169
- Call for a complete range of upgrades

#### NEW DELL DIMENSION® V43c NEW INTEL® CELERON® PROCESSOR 433MHz

- 128KB Single Bank Pipeline Burst Cache
- Intel® 440BX AGPset
- 64MB 100MHz SDRAM
- 9.1GB Ultra ATA Hard Drive
- ATI® 8MB 3D 2X AGP Integrated Graphics
- Yamaha 64 Voice Wavetable Integrated Sound
- 4.8X DVD-ROM Drive and Software Decoding
- 17" Colour Monitor (15.9" v.i.s.)
- Microsoft® IntelliMouse®
- Microsoft® OEM Works Suite 99
- 3Com® USR 56K Capable V.90 PCI WinModem

**\$2,639\***  
plus delivery

or \$22 per week\*\*

Upgrade options include:

- 256MB 100MHz SDRAM \$389
- 13.6GB Ultra ATA Hard Drive (7,200 rpm) \$194
- Call for a complete range of upgrades

## DELL® INSPIRON® FULLY FEATURED NOTEBOOKS

### COMMON FEATURES

#### DELL® INSPIRON® 7000 A366LT INTEL® PENTIUM® II PROCESSOR 366MHz

- 192MB SDRAM
- 14GB Ultra ATA Hard Drive
- 8MB ATI® RAGE LT PRO 2X AGP Video Controller
- High-fidelity Audio SoundBlaster Compatible
- 4X DVD-ROM Drive and Internal Decoder Card
- 15" XGA Colour TFT Display
- Microsoft® OEM Office 97 Small Business Edition
- Realport Ethernet 10/100 and 56K Modem
- Iomega Zip 100MB Internal Drive
- Leather Carrying Case
- Second Battery

**\$8,929\***  
plus delivery

or \$75 per week\*\*

Upgrade options include:

- 256MB SDRAM \$1,400
- 384MB SDRAM \$2,392
- Call for a complete range of upgrades

#### DELL® INSPIRON® 7000 A366GT INTEL® PENTIUM® II PROCESSOR 366MHz

- 128MB SDRAM
- 10GB Ultra ATA Hard Drive
- 8MB ATI® RAGE LT PRO 2X AGP Video Controller
- High-fidelity Audio SoundBlaster Compatible
- 4X DVD-ROM Drive and Internal Decoder Card
- 14.1" XGA Colour TFT Display
- Microsoft® OEM Office 97 Small Business Edition
- Realport Ethernet 10/100 and 56K Modem
- Iomega Zip 100MB Internal Drive
- Leather Carrying Case
- Second Battery

**\$8,049\***  
plus delivery

or \$68 per week\*\*

Upgrade options include:

- 192MB SDRAM \$194
- 256MB SDRAM \$1,594
- Call for a complete range of upgrades

#### DELL® INSPIRON® 7000 A366LT INTEL® PENTIUM® II PROCESSOR 366MHz

- 64MB SDRAM
- 10GB Ultra ATA Hard Drive
- 8MB ATI® RAGE LT PRO 2X AGP Video Controller
- High-fidelity Audio SoundBlaster Compatible
- 24X Variable CD-ROM Drive
- 15" XGA Colour TFT Display
- Microsoft® OEM Works Suite 99
- 56K Data/Fax Modem (V.90 Compliant)
- Deluxe Carrying Case

**\$6,699\***  
plus delivery

or \$56 per week\*\*

Upgrade options include:

- 14GB Ultra ATA Hard Drive \$467
- 128MB SDRAM \$194
- Call for a complete range of upgrades

#### DELL® INSPIRON® 7000 A366GT INTEL® PENTIUM® II PROCESSOR 366MHz

- 64MB SDRAM
- 6.4GB Ultra ATA Hard Drive
- 8MB ATI® RAGE LT PRO 2X AGP Video Controller
- High-fidelity Audio SoundBlaster Compatible
- 24X Variable CD-ROM Drive
- 14.1" XGA Colour TFT Display
- Microsoft® OEM Works Suite 99
- 56K Data/Fax Modem (V.90 Compliant)
- Deluxe Carrying Case

**\$5,599\***  
plus delivery

or \$47 per week\*\*

Upgrade options include:

- 128MB SDRAM \$194
- 4X DVD-ROM Drive and Internal Decoder Card \$331
- Call for a complete range of upgrades

## DELL® INSPIRON® – MAXIMUM MOBILITY NOTEBOOKS

### COMMON FEATURES

- Integrated 256KB L2 Cache
- 3.5" 1.44MB Diskette Drive

#### DELL® INSPIRON® 3500 A366GT INTEL® PENTIUM® II PROCESSOR 366MHz

- 128MB SDRAM
- 10GB Ultra ATA Hard Drive
- 256-bit Graphics Accelerator
- High-fidelity Audio SoundBlaster Compatible
- 24X Variable CD-ROM Drive
- 14.1" XGA Colour TFT Display
- Microsoft® OEM Office 97 Small Business Edition
- Realport Ethernet 10/100 and 56K Modem
- Iomega Zip 100MB Internal Drive
- Leather Carrying Case
- Second Battery

**\$7,629\***  
plus delivery

or \$64 per week\*\*

Upgrade options include:

- 192MB SDRAM \$797
- 256MB SDRAM \$1,594
- Call for a complete range of upgrades

#### DELL® INSPIRON® 3500 A333GT INTEL® PENTIUM® II PROCESSOR 333MHz

- 64MB SDRAM
- 6.4GB Ultra ATA Hard Drive
- 256-bit Graphics Accelerator
- High-fidelity Audio SoundBlaster Compatible
- 24X Variable CD-ROM Drive
- 14.1" XGA Colour TFT Display
- Microsoft® OEM Office 97 Small Business Edition
- Realport Ethernet 10/100 and 56K Modem
- Leather Carrying Case
- Second Battery

**\$5,929\***  
plus delivery

or \$50 per week\*\*

Upgrade options include:

- 128MB SDRAM \$194
- 4X DVD-ROM Drive and MARGI Decoder Card \$486
- Call for a complete range of upgrades

#### NEW DELL® INSPIRON® 3500 C333GT NEW INTEL® CELERON® PROCESSOR 333MHz

- 64MB SDRAM
- 6.4GB Ultra ATA Hard Drive
- 256-bit Graphics Accelerator
- High-fidelity Audio SoundBlaster Compatible
- 24X Variable CD-ROM Drive
- 14.1" XGA Colour TFT Display
- Microsoft® OEM Works Suite 99
- 56K Data/Fax Modem (V.90 Compliant)
- Deluxe Carrying Case

**\$4,339\***  
plus delivery

or \$36 per week\*\*

Upgrade options include:

- 128MB SDRAM \$194
- Iomega Zip 100MB Internal Drive \$243
- Call for a complete range of upgrades

## DELL PRECISION® WORKSTATION

### 2D/3D GRAPHICS SYSTEM

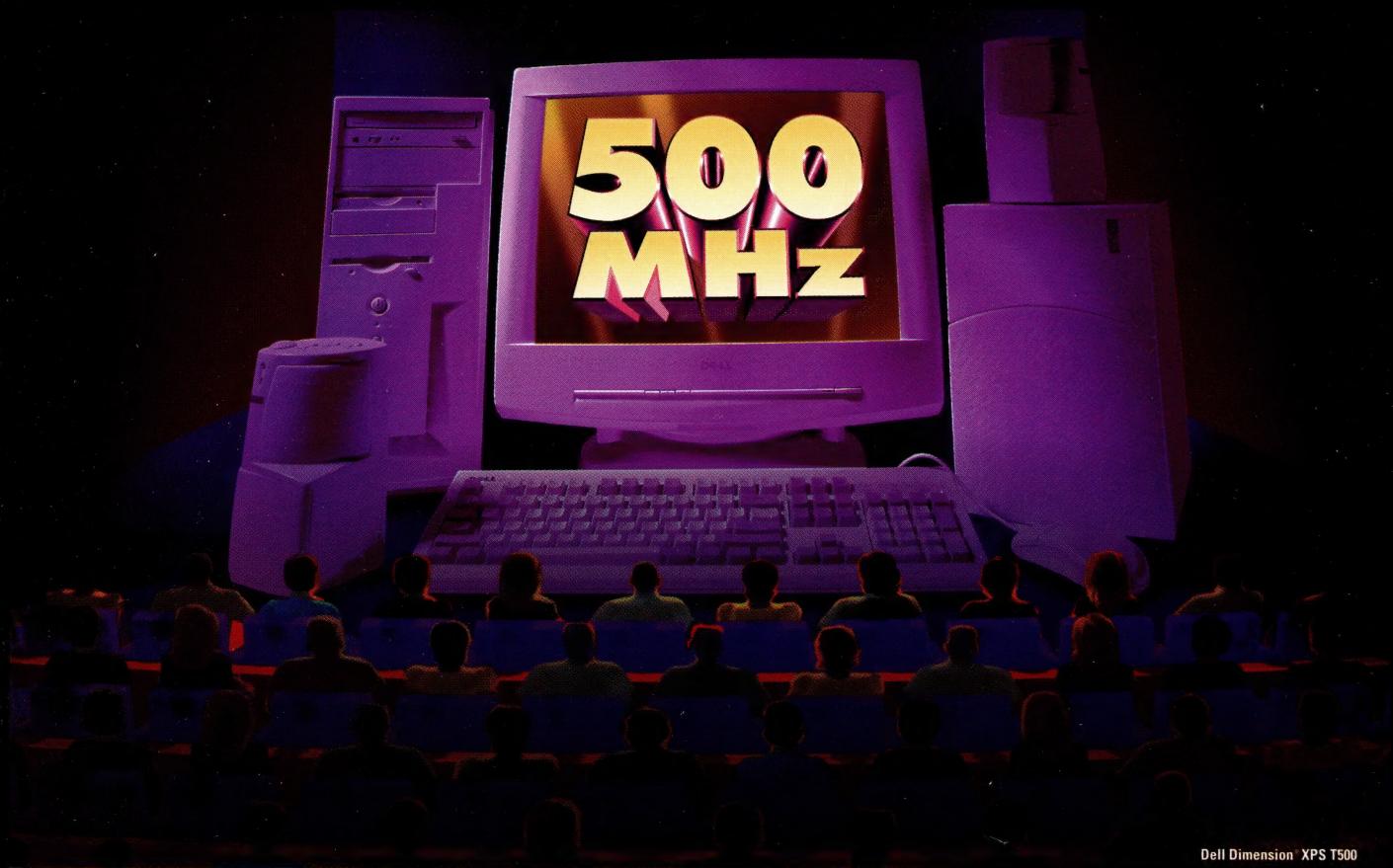
#### DELL PRECISION® WORKSTATION 410 INTEL® PENTIUM® II PROCESSOR 400MHz (DUAL PROCESSOR CAPABLE)

- Mini Tower Chassis
- 64MB 100MHz SDRAM with ECC
- 6.4GB Ultra ATA Hard Drive
- Integrated 3Com® Fast EtherLink XL
- Integrated Sound Blaster Pro Compatible
- Integrated Dual ATA-33 EIDE Controller
- Diamond Permedia 2 8MB 3D 2X AGP Video Card
- Integrated Sound Blaster Pro Compatible
- 32X Variable SCSI CD-ROM Drive
- 17" Colour Monitor (15.9" v.i.s.)
- Dell® Mouse
- 512KB Single Bank Pipeline Burst Cache
- 3.5" 1.44MB Diskette Drive
- Microsoft® Windows® NT 4.0
- 3 Year Limited Warranty
- Free Lifetime Telephone Technical Support

**\$4,469\***  
plus delivery

or \$38 per week\*\*

# PCINEMA.



Dell Dimension XPS T500

Sit tight and prepare for an assault on your senses. The Dell Dimension® T500, powered by the Intel® Pentium® III Processor 500MHz, is now playing in town. Upgrade to the huge, high resolution 21" Trinitron® Monitor (19.8" v.i.s) and treat your eyes to captivating cinema vision, while the 80W Digital Dolby® Surround Sound Speakers with Subwoofer will have the hairs on your neck standing to attention. Include a 16MB AGP Graphics Card, plus a DVD-ROM for razor sharp images and startling 3D sound – with a TV Out to watch movies on PC or TV, and you've got mindblowing performance. For a sneak preview, call Dell today on 1300 303 273 or visit our WebStore at [www.dell.com.au](http://www.dell.com.au)

#### NEW DELL DIMENSION® XPS T500 NEW INTEL® PENTIUM® III PROCESSOR 500MHz

- Mini Tower Chassis
- 512KB Single Bank Pipeline Burst Cache
- 64MB 100MHz SDRAM
- 9.1GB Ultra ATA Hard Drive (7,200rpm)
- 3.5" 1.44MB Diskette Drive
- 16MB Diamond Viper TNT AGP Graphics Card
- Turtle Beach Montego A3D 64 Voice PCI Sound Card
- 40X Variable EIDE CD-ROM Drive
- Harman Kardon HK195 Speakers
- 17" Colour Monitor (15.9" v.i.s.)
- Logitech 4 button MouseMan® Wheel (PS/2v)
- Microsoft® Windows® 98
- Microsoft® OEM Works Suite 99
- Power Game Pack Optimised for Intel® Pentium® III Processors
- McAfee Virus Scan
- 3Com® USR 56K Capable V.90 PCI WinModem
- 3 Year Limited Warranty
- Free Lifetime Telephone Technical Support

**\$3,899\***  
plus delivery

or \$33 per week\*\*

Upgrade options include:  
 • 128MB 100MHz SDRAM \$194  
 • 4X DVD-ROM Drive and Decoder Card with TV Out \$272  
 • Call for a complete range of upgrades

#### NEW DELL DIMENSION® XPS T450 NEW INTEL® PENTIUM® III PROCESSOR 450MHz

- Mini Tower Chassis
- 512KB Single Bank Pipeline Burst Cache
- 64MB 100MHz SDRAM
- 9.1GB Ultra ATA Hard Drive (7,200rpm)
- 3.5" 1.44MB Diskette Drive
- 8MB ATI® EXPERT 980 3D AGP Graphics Card
- Turtle Beach Montego A3D 64 Voice PCI Sound Card
- 40X Variable EIDE CD-ROM Drive
- Harman Kardon HK195 Speakers
- 17" Colour Monitor (17.9" v.i.s.)
- Microsoft® IntelliMouse™
- Microsoft® Windows® 98
- Microsoft® OEM Works Suite 99
- Power Game Pack Optimised for Intel® Pentium® III Processors
- McAfee Virus Scan
- 3Com® USR 56K Capable V.90 PCI WinModem
- 3 Year Limited Warranty
- Free Lifetime Telephone Technical Support

**\$3,139\***  
plus delivery

or \$26 per week\*\*

Upgrade options include:  
 • Iomega Zip 100MB Internal Drive \$146  
 • 13.6GB Ultra ATA Hard Drive (7,200 rpm) \$194  
 • Call for a complete range of upgrades

#### DELL DIMENSION® V400 INTEL® PENTIUM® II PROCESSOR 400MHz

- Mini Tower Chassis
- 512KB Single Bank Pipeline Burst Cache
- 64MB 100MHz SDRAM
- 6.4GB Ultra ATA Hard Drive
- 3.5" 1.44MB Diskette Drive
- Integrated Intel® 10/100 PCI Ethernet Controller
- ATI® 8MB 3D 2X AGP Integrated Graphics
- 32X Variable EIDE CD-ROM Drive
- 17" Colour Monitor (15.9" v.i.s.)
- Microsoft® IntelliMouse™
- Microsoft® Windows® 98
- Microsoft® OEM Works Suite 99
- McAfee Virus Scan
- 3 Year Limited Warranty
- Free Lifetime Telephone Technical Support

**\$2,639\***  
plus delivery

or \$22 per week\*\*

Upgrade options include:  
 • Iomega Zip 100MB Internal Drive \$146  
 • 9.1GB Ultra ATA Hard Drive (7,200 rpm) \$97  
 • Call for a complete range of upgrades



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Dell® Inspiron® 7000 with a 15" screen

## DELL® INSPIRON® 7000 333LT INTEL® PENTIUM® II PROCESSOR 333MHz

- Integrated 256KB L2 Cache
- 64MB SDRAM
- 6.4GB Ultra ATA Hard Drive
- 3.5" 1.44MB Diskette Drive
- 8MB ATI® RAGE LT PRO 2X AGP Video Controller
- High-fidelity Audio SoundBlaster Compatible
- 24X Variable CD-ROM Drive
- 15" XGA Colour TFT Display
- Microsoft® Windows® 98
- Microsoft® OEM Works Suite 99
- 56K Data/Fax Modem (V.90 Compliant)
- Deluxe Carrying Case
- 1 Year Limited Warranty
- Free Lifetime Telephone Technical Support

## DELL® INSPIRON® 3500 A366GT INTEL® PENTIUM® II PROCESSOR 366MHz

- Integrated 256KB L2 Cache
- 64MB SDRAM
- 4.3GB Ultra ATA Hard Drive
- 3.5" 1.44MB Diskette Drive
- 256-bit Graphics Accelerator
- High-fidelity Audio SoundBlaster Compatible
- 24X Variable CD-ROM Drive
- 14.1" XGA Colour TFT Display
- Microsoft® Windows® 98
- Microsoft® OEM Works Suite 99
- 56K Data/Fax Modem (V.90 Compliant)
- Deluxe Carrying Case
- 1 Year Limited Warranty
- Free Lifetime Telephone Technical Support

## NEW DELL® INSPIRON® 3500 C333GT NEW INTEL® CELERON® PROCESSOR 333MHz

- Integrated 128KB L2 Cache
- 64MB SDRAM
- 6.4GB Ultra ATA Hard Drive
- 3.5" 1.44MB Diskette Drive
- 256-bit Graphics Accelerator
- High-fidelity Audio SoundBlaster Compatible
- 24X Variable CD-ROM Drive
- 14.1" XGA Colour TFT Display
- Microsoft® Windows® 98
- Microsoft® OEM Works Suite 99
- 56K Data/Fax Modem (V.90 Compliant)
- 1 Year Limited Warranty
- Free Lifetime Telephone Technical Support

You could sell tickets to your next presentation when you take the Dell® Inspiron® 7000 on the road. See your performance come to life on an eye catching 15" screen (the largest available for a Dell notebook). The 8MB ATI® RAGE LT PRO Video Controller, which allows for Dynamic 3D graphics and full motion video will dazzle your audience. Now include a DVD-ROM for razor sharp images and startling 3D sound, and the fastest mobile Intel® processor too and you've got an unbeatable act. To discover how the Inspiron® 7000 can make you a star, call Dell today on 1300 303 273 or visit our WebStore at [www.dell.com.au](http://www.dell.com.au)

**\$5,599\***  
plus delivery

or \$47 per week\*\*

Upgrade options include:  
• 128MB SDRAM \$194  
• 10GB Ultra ATA Hard Drive \$933  
• Call for a complete range of upgrades

**\$5,279\***  
plus delivery

or \$44 per week\*\*

Upgrade options include:  
• Iomega Zip 100MB Internal Drive \$243  
• 6.4GB Ultra ATA Hard Drive \$194  
• Call for a complete range of upgrades

**\$4,339\***  
plus delivery

or \$36 per week\*\*

Upgrade options include:  
• 64MB SDRAM \$97  
• Second Battery \$194  
• Call for a complete range of upgrades



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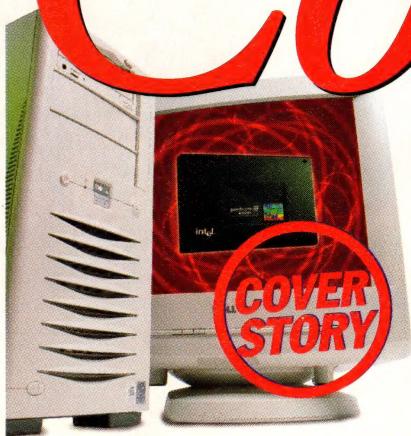
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DELD0117/PCA/RH

# Contents



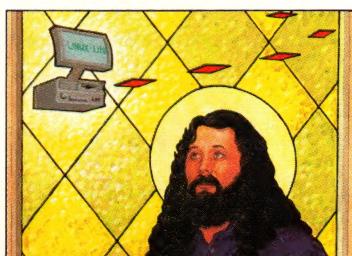
## 84 OUR FIRST PIII XEON



## 48 PAY LESS, GET MORE



## 64 CD-BURNERS TESTED



## 128 THE MAN BEHIND LINUX

## PC @UTHORITY LABS TESTS

### 48 SUB \$1,500 PCs

Not everyone can afford to buy the very latest bleeding-edge-of-technology PCs. With that in mind, we've gathered together a wide range of budget computers, and put them through our rigorous Benchmarks to find the best bang for your bucks.

### 64 CD-RWs

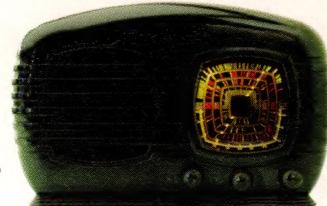
Floppy disks are convenient, but inherently unreliable. Zip drives are spacious, but backing up your hard disc requires something much larger. Enter the CD burner. CD-Rs and CD-RWs can back up a lot of information quickly, and the media is cheap and reliable. Check out the our Labs to find the best performer of a competitive pack.



## FEATURES

### 142 THE NEW MUSIC

The ever-growing popularity of the World Wide Web is beginning to change the way a lot of people listen to, and distribute, popular music. MP3 is bringing the latest pop tunes to your desktop, artists are dodging record label dominance, and the labels themselves are trying to fight back. Craig Stephens gets down and dirty with music online.



### 128 MEET THE MAN BEHIND LINUX

Jack Schofield meets Richard Stallman, the founder of the Free Software movement and one of the driving forces behind Linux, and discovers what makes him tick.

### 134 POWERPOINT MASTER CLASS

Are you nervous about speaking to a crowd? Guy Swarbrick guides you through successful Microsoft PowerPoint presentations that won't have your audience dropping off with boredom.

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## COVER DISK

8 Exclusive! This month PC @uthority teamed up with Inprise to give you the full working version of Borland JBuilder 2 Standard worth \$169 - Absolutely FREE! JBuilder 2 is a comprehensive set of visual development tools for creating Pure Java business and database applications. There's also a great selection of demo and freeware software including Home Loan Analyser, HomeSite v4.0, Office Essential, MAUS Debt Collector, ACID Music and Painter 5.0 with a tutorial.



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90 Full metal jacket. The most desirable PDA yet.



92 Canon raises the bar on digital photography



92 ATI momentarily steals the performance crown from nVidia's Riva TNT.

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## REAL WORLD COMPUTING

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Technical troubles? CPU confusion? Windows worries? Our expert David Moss is here to help.

### ADVANCED WINDOWS .....

Jon Honeyball tugs at the seams of Windows 2000, examines Linux and is enraptured by The Qube.

### APPLICATIONS .....

Get to grips with the euro and Microsoft Outlook Contacts with our ace applications man Simon Jones.

### WEB BUSINESS .....

Want to make money out of the Web? Paul Ockenden and Mark Newton mean business.

### PDAs .....

For handheld know-how, turn to PDA expert Paul Lynch.

### VISUAL PROGRAMMING .....

From critters in VB to bug fixes and code updates, Dave Jewell has it covered.

### MULTIMEDIA .....

Kevin Partner revisits new and improved versions of the leading multimedia authoring tools.

### PUBLISHING/GRAFICS .....

Graphics guru Tom Arah adjusts his view on digital cameras.

### NETWORKS .....

Steve Cassidy solves a common networking problem and uncovers a WinFrame oddity.

### BACK OFFICE .....

It's never too early to start looking at Windows 2000's Active Directory. David Moss spills the beans.

### UNIX AND JAVA .....

David Evnall gets knee-deep in open source software, FetchMail, Cron and Pilot-Link.

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# COVER DISC

## Borland JBuilder 2 Standard



**JBuilder is a comprehensive set of visual development tools for creating Pure Java business and database applications.**

This month's special offer for PC @uthority readers is Borland JBuilder 2 Standard worth \$169-ABSOLUTELY FREE!

### Integrating enterprise and Internet computing

JBuilder 2 is ideal for building applications that take advantage of the rapidly converging enterprise and Internet environments. Java is object-oriented, secure,



portable, and Internet-aware. JBuilder builds on these strengths and delivers a comprehensive set of visual tools for creating Pure Java business applications, applets, and reusable JavaBean components.

JBuilder 2 is a reliable, extensible and scalable Java development tool. And with Jbuilder Pure Java applications, you can develop once, and deploy on any Java platform.

### Java Rapid Application Development

JBuilder 2 RAD WorkBench delivers a combination of fully integrated Application Browser, Pure Java Two-Way-Tools, project manager, code editor, HTML editor, BeansExpress, DataExpress, graphical debugger, and lightning-fast compiler.

JBuilder 2 gives you visual productivity and control over your code. The Pure Java Two-Way-Tools maintain

**Software valued at \$169 - ABSOLUTELY FREE!**

seamless integration between the visual designers and the code editor. So, developers can switch between the two with confidence that they are always synchronized.

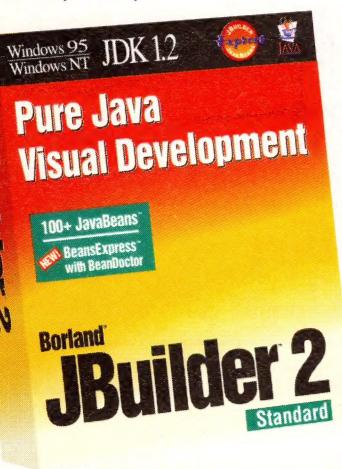
### Simplify code management and increase productivity

The JBuilder 2 Application Browser makes it easy for Java developers to manage their projects. It combines the features of a project manager, class browser, file browser, and source code editor. You can browse into source files, class files, zip files, and jar files, so you completely understand the structure of your code.

### Slash development time with reusable JavaBeans

The only way to reduce development cycles and simplify maintenance is to make extensive use of reusable components. The Jbuilder 2 JavaBeans Component Library includes Grid, Tree, Navigator, Image, Checkbox, Choice, List, Locator, ButtonBar, StatusBar, and more than 100 other JavaBeans.

**SPECIAL OFFER**  
to PC @uthority readers to upgrade  
to JBuilder 3, turn to page 193



Installing the CD: When asked for a serial number, type: 1000057287; for authorisation key type: 97-7-0-0

PC @uthority cover CDs are created using Traxdata's CDR4120 PRO CD-writer and Traxdata CD-R media. Traxdata can be contacted on (02) 9956 6906.

**TRAXDATA**

## Painter 5.0 plus tutorial

**REQUIRES** Windows 95/98 or NT4, 16Mb RAM

**LIMITATIONS** Save, print and some features that require advanced system services are disabled. Also features a smaller selection of art materials.

**CONTACT** Scholastic New Media (02) 4329 9336

**P**ainter 5.0 is a digital painting tool with hundreds of Natural-Media brushes and effects. Painter 5.0 contains digital painting tools that simulate traditional artists materials. There is an extensive array of brushes, chalks, charcoal, airbrushes, watercolours and crayons. Painter 5.0 also goes beyond the traditional with plug-in brushes that allow you to paint with fire, flames or

neon laser beams, spraypaint, paper textures and more. Dynamic plug-in floaters allow you to perform image effects with floating layers that transform an underlying image without altering your original artwork.

The Web Edition of Painter contains some extra tools such as Image Slicing to optimise download time of graphics, single click button creation, seamless tiled background patterns and more.

For a review of Painter 5.5 Web Edition see page 106.



## Home Loan Analyser

**REQUIRES** Windows 95/98 or NT

**LIMITATIONS** Limited functionality

**CONTACT** Uniwin Pty Ltd.

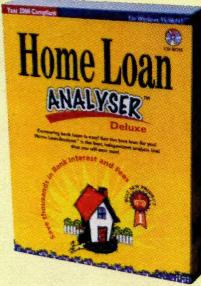
(03) 9882 0000

**H**ome Loan Analyser is a program that allows you to calculate and compare home loan offerings from any lenders. Compare any fees, interest rates, termination penalties, application fees and much more. The program is Australian made for Australian

**UNIWIN**

conditions. Some of the features include a loan affordability estimator, check the effect of application and transaction fees, compare two loans simultaneously, calculate effects of paying weekly, fortnightly, monthly, increasing or reducing your payments, compare 'honeymoon rates' with normal interest rates, plus much more.

For a full review turn to page 107.



## NeoPlanet

**REQUIRES** Windows 95/98 or NT, IE4

**LIMITATIONS** None

**CONTACT** [www.neoplanet.com](http://www.neoplanet.com)



**N**eoPlanet is an Internet browser that can be customised to reflect each user's unique interests and personality. There is a default set of channels on the browser, but the customisation tools allow you to edit channels, change schemes, play sounds, and more. NeoPlanet also features integrated email, a Modem Speed Booster for optimizing the speed of your Internet connection, and a targeted Search function, plus enhanced browsing features that can get you to the site you want even if you don't know the URL. Extra skins for NeoPlanet can be downloaded from the NeoPlanet Web site.

## PC @uthority Cover CD Contents

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Office Essential  
Homesite v4.0  
Home Loan Analyser  
ACID Music  
MAUS Debt Collector  
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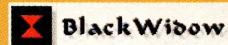
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## BlackWidow

**REQUIRES** Windows 95/98 or NT4

**LIMITATIONS** 15 day trial

**CONTACT** <http://www.softbytelabs.com/BlackWidow/>



**B**lackWidow is a site ripper, a site-mapping tool, an off-line browser, a site mirroring tool, and a site scanner. BlackWidow has the ability to download entire sites onto your hard drive for offline viewing at a later time, keeping the site layout intact. It can be used to create a mirror site of an existing site, duplicating the current file structure. BlackWidow will also download the file contents of a site, either partially or in its entirety, depending on your specifications. You can also run multiple instances of BlackWidow to work with different Web sites at the same time. The download program works independently of the main program, so you can download files from one site while profiling another.

## TransMac v3.4

**REQUIRES** Windows 3.1/95/98 or NT

**LIMITATIONS** Formatting and folder operations are disabled.

**CONTACT** [www.asy.com](http://www.asy.com)

**T**ransMac is a PC Windows utility that can read, write and format Macintosh high density diskettes, CDROMs, and SCSI drives (SyQuest, Bernoulli, Zip, optical, hard drives, etc.). This program brings the Mac and PC worlds together so you can make the best of both worlds. Some of the features include; long filename support, deleting/copying directory trees, search disk by type/creator/extension, multisession CD support and keep or refresh file dates between copy.

## Groone's Macroer

**REQUIRES** Windows 95/98 or NT

**LIMITATIONS** None

**CONTACT** [www.groonesworld.com](http://www.groonesworld.com)

**G**roone's Macroer allows you to automate repetitive tasks on your computer without having to learn a complex and confusing scripting language. Simply tell it to record, and every action you take is stored, ready to be played back. Should you so choose, a simple scripting tool is available to build your own macro, or edit a recorded one.



## HomeSite

**REQUIRES** Windows 95/98 or NT4

**LIMITATIONS** 30 day trial

**CONTACT** East Coast Software

**H**omeSite is an HTML editing tool that lets you build Web sites while maintaining Pure HTML. HomeSite maintains the integrity and formatting of HTML pages and does not add any code to the HTML page other than what is necessary for display through a



browser. With HomeSite you can also access the latest Web technologies, such as DHTML, SMIL, Cascading Style Sheets and JavaScript.

When building the Web site, users can easily switch from directly coding HTML, DHTML, SMIL, and JavaScript (Edit View) to working in a higher-level visual development environment (Design View) to checking

## MAUS Debt Collector

**REQUIRES** Windows 95/98 or NT

**LIMITATIONS** Limited functionality.

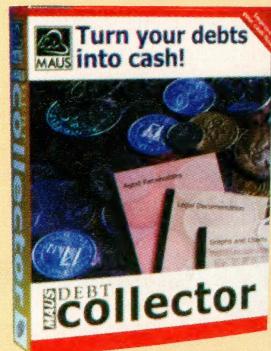
**CONTACT** Business Systems (02) 9957 3827

**M**AUS Debt Collector will automate collection of outstanding payments, optimise cash flow and minimise bad debts. Suitable for business of any size or type that need to control, manage and minimise the reoccurrence of debt, and the time and cost spent on collection. MAUS Debt Collector can be installed, customised and activated overnight. Able to integrate with 95 per cent of accounting software (eg. QuickBooks, MYOB and Attach). Debtors are automatically imported to Debt Collector.

A mail merge facility will forward courteous reminders, or letters of demand, the contact manager records conversations, and will advise on the next recommended course of action.

Professional letters, telephone scripts, legal forms, procedures and advice are included in MAUS Debt Collector.

For a full review of MAUS Debt Collector turn to page 119.



## E-Icons 98

**REQUIRES** Windows 95/98 or NT, 486 processor, 8Mb RAM.

**LIMITATIONS** None

**CONTACT** <http://members.xoom.com/EasyIcons98>

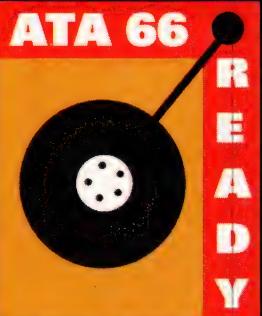
**E**-Icons 98 lets you easily customize shell icons on your system, including ones for the Desktop, Start Menu, Drives, Folders and Files. It supports icon themes so you can change all icons at once or create your own ones, and it also gives you the opportunity to assign an icon to any folder, any drive and any file type. If you love to customize the way your system looks, E-Icons 98 is worth a look-in. The program comes with two icon themes to get you started. You can also download new themes from the E-Icons 98 Web site.



the site in an internal browser (Browse View). To help visualise the site, HomeSite's Site View gives a hierarchical view of the entire Web site and integrates the link verification and document weighing quality control features.



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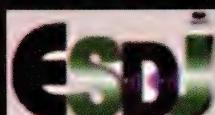
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Hannover  
1998



Durchsetzungssieger



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**westan**

# LEISURE

## Half-Life Uplink

The story of this hugely popular single or multi-player shoot-em-up game begins deep in the bowels of the Black Mesa Federal Research Facility. You are Gordon Freeman, a young research associate with no real idea of just how dangerous your job has become, until the morning you are sent alone into the Test Chamber to analyse a strange crystalline specimen. A routine analysis, they tell you. Until something goes wrong.

All you hear is screaming; all you see is spacetime shattering. The next thing you know, the entire Black Mesa Facility is a nightmare zone, with sirens wailing and scientists fleeing in terror from the things their co-workers have become.

Half-Life Uplink combines the visceral



action of legendary action games like Doom with great storytelling. There's also a variety of exciting multiplayer scenarios, and an easy-to-use interface.

Save the Earth? Well, maybe. But that's a pretty low priority compared to saving your own skin.

## Descent 3

The Descent franchise is fast becoming one of the most popular gaming worlds ever, right up there with titles like Wing Commander and MechWarrior. Now, at last, Interplay is about to release the latest tunnel running, robot shooting episode - Descent 3.

As you expect, robot AI has been tweaked

to provide the most challenging gameplay yet, while level design and graphics have both reached new heights of complexity.

Thirty new robots are about to test your flying and shooting ability to the limit, by co-operating against you, calling for reinforcements and running away to repair themselves and then come on again. Each bot has an individual way of behaving, as well as flaws and advantages.

Graphically, the new game uses the advanced Fusion Engine, which blasts you seamlessly from inside to outside. Melding a flight-sim engine with a room-based, structural engine allows the action to race on at full speed, with no interruptions, indoors and out - yes, at last you get to fly on the surface, from tunnel to tunnel, and deal with those insidious robots out in the open.



## ACID Music

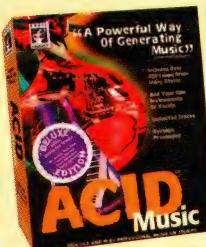
REQUIRES Windows 95/98 or NT4.

LIMITATIONS Limited functionality

CONTACT Moore Music (03) 9419 0344

**A**CID Music is a loop-based music production tool for loop arranging and editing. Click and drag to combine and mix loops. Make real-time changes to pitch and tempo, and control the volume, pan and effect envelopes for each track to create the mix you want. ACID Music supports multiple real-time effects with DirectX plug-ins and provides easy access to Sound Forge or other audio editors. ACID Music features a sound library with hundreds of loops in many different instruments and musical styles. You can apply effects like reverb, echo, and delay, record instruments or voice and preview any loop before adding it to the mix.

For a full review of ACID Music turn to page 105.



A large amount of thought and effort goes into the compiling of the PC @uthority cover disk. It is very important to us that you get the very best out of it and we constantly strive for this goal. If you

experience any problems with installing software supplied on the CD then please either email us at [pc@uthority.ajb.com.au](mailto:pc@uthority.ajb.com.au) or call us on our Helpline (02) 9317 4266.

## Broken or missing CDs

If your CD has been damaged in the post, please return it, along with your name and address and subscriber number (if applicable). If you are a subscriber and didn't receive the CD with your copy, please call (02) 9317 4266 for a replacement.

## Installation of CD-ROM software

Insert the CD into your drive and use the Run... option from the file manager, or from the Start Menu of Windows 95/98 or NT 4 and run `d:\browser.exe` where `d:` is the name of your CD-ROM drive.

Also, your input is invaluable so please let us know if there's a particular product that you'd like to see included on the CD - we'd love to hear from you! (email: [pc@uthority.ajb.com.au](mailto:pc@uthority.ajb.com.au)).

## Use CDs at your own risk

Although all CDs are rigorously checked for errors and viruses, AJB Publishing Limited cannot accept any responsibility for any loss or damage to your data or computer system which may occur while using the cover discs or the programs or data on them.

## Animated Email Magic

REQUIRES Windows 95/98, 40Mb hard disc space.

LIMITATIONS 30 day trial

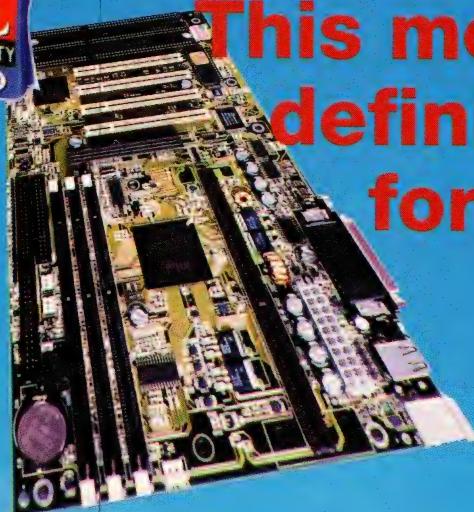
CONTACT [www.arcamax.com](http://www.arcamax.com)

**A**nnimated Email Magic can be used with any Internet Email program to liven up your messages. With version 2.0 you can create multiscene animations that are like mini cartoons, or hyperlink to your favourite Web sites, pages or announcements. Choose characters and foreground images, then you can add your background and border design, and click on your animating effects. You can also drag and drop any file from your albums into your animated messages. To save time there are ready to use animated greetings included in the program.



# SUPERMICRO®

## P6SBA



**This motherboard is definitely a "Must Have" for your new PC**



US based manufacturer SuperMicro has been in the motherboard industry for some time, gaining a reputation amongst the Labs team for excellent build

quality and documentation. Continuing this tradition, it's encouraging to see that the SuperMicro engineers have added superb performance to the product line. The P6SBA is a single Slot 1 motherboard that uses the Intel 440BX chipset and streaks ahead of all the other boards tested this month. Expansion capability is also impressive thanks to four PCI and three ISA slots as well as three DIMM sockets.

Power-crazed users will be pleased to hear that there are two chassis fan power connectors, while the sensible PCB layout means that the components don't get in each other's way. Meanwhile, first-time upgraders will benefit from the best manuals supplied by any of this month's motherboard manufacturer's, in particular the excellent troubleshooting section.

If you're looking for a Slot 1 motherboard upgrade, the SuperMicro P6SBA exudes quality. It's both fast and good value for money, making it the motherboard of choice.

**Ask your nearest dealer about the Supermicro P6SBA motherboard today**

PC @uthority	PERFORMANCE	FEATURES	VALUE FOR MONEY	OVERALL
	★★★★★	★★★★★	★★★★★	★★★★★
	★★★★★	★★★★★	★★★★★	★★★★★
	★★★★★	★★★★★	★★★★★	★★★★★
	★★★★★	★★★★★	★★★★★	★★★★★

See article in PC @uthority March 1999 page 64

Since their release, the 440BX based motherboards average a 0.1% RMA rate\* - a high standard that beats all others in the industry.

\* RMA rate is based on RMA records for three months of product shipment.

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Please note that all judgements have been made

in the context of equipment available to

PC @uthority at time of review, and that 'value for money' comments are based on Australian prices at the time of review, which are subject to fluctuation and are only applicable to the Australian market.

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**Networks** Steve Cassidy

**PDAs** Paul M. Lynch

**Technical Support** David Moss

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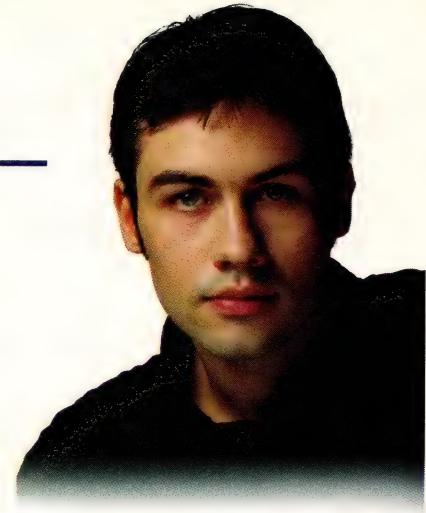
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# TAKING THE PLUNGE

*Has online shopping finally come of age?*



**A**s Editor of *PC Authority* magazine, using computers and the Internet is an integral part of my daily routine. One thing, however, that I've never actually tried is purchasing something from an online shop. So, with a bit of trepidation, I decided to begin my foray into the world of online shopping by purchasing a book from probably the most widely known online bookstore, Amazon.com. ([www.amazon.com](http://www.amazon.com))

For the most part, when it comes to buying products on the net, people are somewhat apprehensive. The main fear is that their credit card details will be intercepted during transmission to the site, and pirated. No one wants to open their next credit card bill to find that they've just sprung for a wild weekend at the Waldorf for a hacker and ten of his closest mates.

With this scenario in mind, I was relieved to find that my Amazon.com book purchase required me to enter into a 'secure' site. Essentially, this is a way of encrypting the information sent between your PC and the host's Web site. It requires a 'secure' server at the host's end and that your Web browser supports secure transmissions on your end. Fortunately, the last couple of incarnations of Internet Explorer and Netscape Navigator support secure transmissions, and you'll know your in one when a small padlock icon appears at the bottom of your browser's window.

Another thing that deters people from buying online is that they'll find something that they want, pay for it, and then never receive it. When they try to chase up their order, they find that the site

has disappeared without a trace into the neither regions of cyberspace. Although it's uncommon, there are professional looking sites out there that will take your money and run. For the most part, sticking to well-known sites and ones that have been recommended through magazines, radio and television should keep you out of trouble.

Another way of telling if a site is reputable is through the use of digital 'certificates'. A site can issue a certificate to you that identifies its address as well as the date that the certificate was issued. The certificate, supported by Internet Explorer

the cost, my order number, the wrapping paper I'd chosen, and that I'd opted to use a priority courier.

It was only four days later that I received a well packaged box from Amazon.com. I eagerly opened it only to find that the gift-wrapped book that I'd sent to myself was the wrong one. I had somehow been treated to *A History of White Magic* instead of *A History of Western Philosophy*. I don't know which you'd rather, but I'm not really into casting spells.

Anyway, this brings me to the next problem with buying online: these shops exist in an intangible place where you can't

just walk into one and get an exchange or refund. This is why it's imperative that you find out how a site's return and refund policy works. Fortunately for me, Amazon.com has a top-notch customer service department. Within half an hour of posting an email about my white magic book, I

was sent a reply. Amazon apologised graciously for the mistake, immediately dispatched the correct book with its priority courier service, refunded the difference between the courier that I had ordered and the regular shipping method, and, last but not least, gave me the White Magic book to keep. Needless to say, I was very impressed.

With reputable companies like Amazon.com selling on the net, you really have nothing to worry about. Just make sure that your current browser supports secure transmissions and certificates. With the time that I saved by shopping online, perhaps I can sit down and learn a bit from my new book and cast a little white magic to protect the purchases of others.

**'NO ONE WANTS TO OPEN THEIR  
NEXT CREDIT CARD BILL TO FIND THAT  
THEY'VE JUST SPRUNG FOR A WILD  
WEEKEND AT THE WALDORF...'**

and Communicator, is kept on your local machine. When you enter a site, your browser checks to see if the certificate that it holds matches the information on the Web site. If so, you're in a site that you can trust, if not, there's something fishy going on.

I was confident that the Amazon.com book site was legitimate - it certainly had the look of a professional outfit, plus, it wouldn't have developed such a good reputation from ripping people off. If I was really uncertain, I could have emailed Amazon and asked an administrator to send me a digital certificate.

After I ordered my book, Amazon emailed me a receipt with all of the details of my purchase including the book's title,

# DHCMRLCHTDJ

*What is the point of looking for order in random collections of letters and numbers?*



**T**wo recent and apparently unrelated cultural events turned my thoughts toward the concept of randomness. One event was seeing Darren Aronofsky's odd little movie *π*, about a mathematical genius who is obsessed with the infinity of digits required to express the value of the irrational number pi. It's a stylish and slightly pretentious work of fiction, although it does bear some similarities to the real-life story of the oddball Chudnovsky brothers from Russia who turned their New York apartment into a supercomputer in order to calculate a billion places of the decimal representation of pi. They used \$US70,000 worth of mail-order Intel PC motherboards – strung together into a message-passing parallel architecture of their own design, with boards festooned around the walls like fairy lights on a Christmas tree – to achieve computing speeds of up to 2Gigaflops. Why did they do it? To see if they could find patterns in pi – the modern equivalent of the alchemist's search for the Philosopher's Stone.

The other event was the publication of a new translation of the complete short stories of Jorge Luis Borges (called *Collected Fictions*), which includes *The Library of Babel*. I first read this at grammar school, when it struck me like a bolt of lightning. (In fact, nothing ever struck me so powerfully again until I discovered, many years later, Isaac Babel's *Red Cavalry* stories; the coincidence of names is uncanny though.)

Those who have read *The Library of Babel* must bear with me while I summarise its plot. The library is, we guess (although no-one knows) an infinitely large structure, composed of bookshelves arranged in a circular fashion around a central spiral staircase. Each shelf holds 64 identical volumes, each of 410 pages, and these pages are filled with totally random letter combinations. The library is inhabited by a race of librarians who spend their lives plodding from shelf to shelf, up and down stairs, reading the books and looking for passages that make sense. Occasionally

a couple of them bump into one another and swap excited stories of having discovered two consecutive words of comprehensible Spanish, or an almost-correct phrase in English. None has ever read more than a short sentence of sense. But all of them know that somewhere in the library exist the complete works of Shakespeare, of Raymond Chandler (perhaps even of Irvine Welsh) and all of the back issues of *PC Authority*, as well as all of these translated into every known human language and many languages not even yet invented. And all of these things also exist written both forwards and backwards, with one word wrong, or two words wrong, and so on. Now and again a librarian hurls himself down the infinite stairwell, as you would.

Now, I could use this story as a cheap metaphor for searching the Web using AltaVista, but I will resist that temptation.

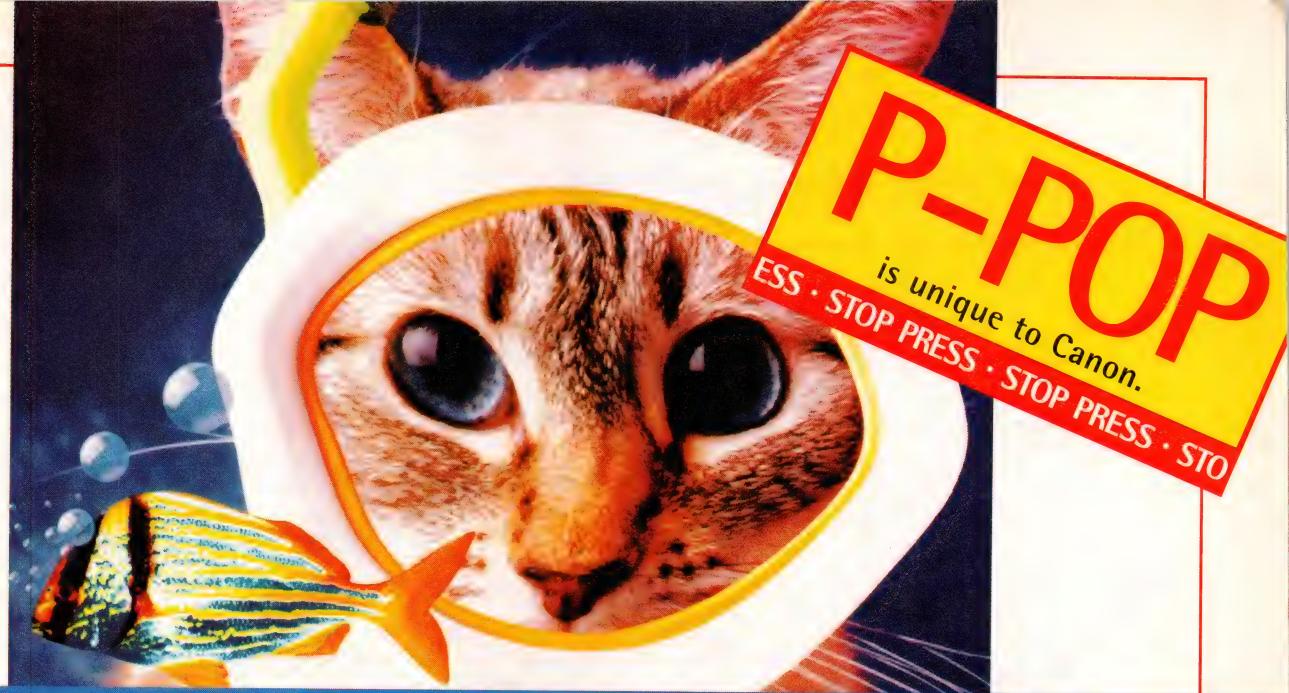
## 'I COULD USE THIS STORY AS A CHEAP METAPHOR FOR SEARCHING THE WEB'

I'd rather concentrate on the connection with *π*. The point is that pi contains the Library of Babel. Probably. Write out pi in decimal notation (or in hex if you're a true hacker), split it up into consecutive pairs of digits and interpret each pair as an ASCII character, and you'll end up with an infinitely long string of random characters. Individual words might look a bit long if 32 (the ASCII space character) occurs less frequently than it does in typical English, but you could easily fudge that by reusing those digit pairs that encode non-alpha characters. What I'm suggesting is that the Chudnovsky brothers are engaged on the same quest as Borges' librarians of Babel (they live on a top floor as well) – nothing less than the quest for sense, or order, among the randomness of the universe.

I'd also suggest that, as with the Holy Grail and the Philosopher's Stone, this quest is an illusion, engendered by the human species' overdeveloped cerebral cortex, which often leads us to believe that because we can name something, it must exist. Order does indeed exist among the randomness, but it's not our thoughts that create it, it's our very life. Life (that is, the DNA-based life we know about) is a spectacularly effective mechanism for creating order out of randomly moving molecules and stringing them together into genes and proteins, as well as apparently flouting the Second Law of Thermodynamics in the process. Every living thing is in effect a rather large but meaningful volume in *The Library of Babel*.

This isn't to say there's no point in studying randomness. On the contrary, perhaps the most important and interesting field of purely

intellectual endeavour (since philosophy and the social sciences disappeared up their post-modern fundaments) is algorithmic information theory, which does precisely that. Founded by Gregory Chaitin, a researcher at IBM, this branch of mathematical computer science seeks to measure how complex bit strings are by the amount of computation required to reproduce them. For example, the infinite string 1111111... is very simple, because the algorithm 'keep on writing ones forever' will reproduce it. The string 12121212... is only a little more complex. At the other extreme, some strings are so complex that they're already their own simplest representation. Pi is one of these, and such strings provide our only satisfactory definition of what 'random' actually means. Actually, most of the possible strings are of this random nature (they're the Library), but more interesting are those very, very rare (though still infinite in number) strings that fall between these extremes: the ones that take a large but finite amount of computation to reproduce, such as *War and Peace*, *The Library of Babel* or, indeed, this column.



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New BJC-7100 - \$599<sup>RRP</sup>

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## ALL FOR ONE

*Will AOL, Netscape and Sun be stronger if their proposed alliance goes ahead?*



**N**ow that most of the fuss generated by the AOL/Netscape/Sun announcement has calmed down, it's time to take stock of what's actually happened and what it all means for you and me if regulators approve the deal.

Before I start though, I should point out that I really like the AOL service. Portals are, of course, very important because the Internet is too fragmented, anarchic, big and raw for most people, most of the time. The simple fact that you can go to a major search engine, search for anything mainstream and a proportion of the resultant top ten recommended sites will contain porn, is a clear indication that something is deeply wrong with that method of information retrieval.

In order to make sense of the ocean of information out there, we need to have portals that provide an active editorial processing function. We also need actively moderated chat areas – do you really want to expose yourself to the raw nature of Internet Relay Chat?

Which is why I always use AOL, be it to talk to friends, check the weather report or read the news feeds. This is despite the fact that the software – including the new AOL 4 – could be better. The chatroom features are clunky as there's no facility to log chats sensibly, unless you buy third-party software at extra cost. The user interface is quirky in the extreme, and the software authors clearly have some extremely dubious ideas about UI design. Worse still, AOL 4 is broken on NT 4 because Web accessing via AOL rarely works on NT. It seems that AOL's new flagship 32-bit client becomes confused as to where the TCP/IP stack is pointing to, where the default gateway is and so forth.

But, and it is a big 'but', I grin and bear AOL 4 because I find the online content worthwhile and, for me, it's the content that matters most at the end of the day.

Now take a look at the acquisition of Netscape, the proposed licensing of the

server-side business to Sun and the announcements of AOL's ambition for a family of AOL-specific devices down to small-scale domestic items. I would dearly love to think that this will come to fruition – after all, AOL plus Netscape plus Sun would be a large, dominant player. I would also love to see bijou Java devices that could talk into AOL and via the Internet and do useful things. But do I really believe the three will pull this off? In short, no.

AOL has been hugely successful in reaching millions of users around the globe. But moving into new business areas outside of its existing infrastructure is going to be tough. This is especially true for Web functionality, but AOL will have to move to a more Web-centric information store. The

other than the fact that they all want to seriously dent Bill Gates' personal fortune?

Consider the three companies' respective core competencies. Sun excels in the super-server arena and in high-power workstations – it simply doesn't work in the \$1,500 marketplace. Any third party wanting to work in this space is going to have to look to an Intel core or something like Windows CE. After all, where are all those little Java boxes we've been promised? Will the third-party hardware vendors get behind AOL as a company in the same way they get behind Microsoft? It's hard to see that happening any time soon.

Netscape has an excellent set of products, Sun is licensing server products, and the client-side will just get swallowed up by the AOL code monster.

If the three players were serious, they would launch, right now, a kit that would allow people to undertake small-scale, low-cost, low-risk, Web-based Internet commerce structured around the existing AOL financial setup. People won't set up shops on AOL just so they can get their hands on this stuff alone – Microsoft tried it with MSN, and it didn't work then. The world is crying out for some FrontPage commerce server extensions and a set of Wizards to make building an Internet shopping presence a five-click problem. Naturally, they would push forward with new ideas, but history shows that company mergers never shorten timescales, they only extend them.

AOL should be radically updating its software – AOL 4 is an underachiever. Most of all, AOL plus Netscape plus Sun needs a clear, combined vision that's self-sustaining and based on solid customer requirements. The goal shouldn't be to blow Microsoft out of the water but to serve the customer's needs.

My prediction? Netscape will change beyond recognition within the next 12 months, Sun will receive little exposure, and AOL will trundle along as if nothing has happened. What a wasted opportunity.



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up to A3.  
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ations of conventional CMYK inks. Combined with Drop Modulation Technology the result approaches silver halide quality reproduction.

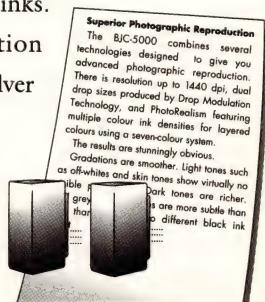
**An all-new approach to black.** It uses new, black ink that is blacker than conventional ink. As a result, black & white documents have an exceptionally high degree of finish. Two of these cartridges (BC-23) are included in the box, and may be used simultaneously.

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# TEEN SPIRITS

*Are IT gurus the wizards of a new, wired society or just fantasy-fuelled nerds?*



Out of all the IT enthusiasts you know, how many of them were hooked on role-playing games as teenagers? Maybe some of them still are. The fact is, the same urge that leads people into wanting to escape into a world of fantasy as a youngster often leads to computing. It would be quite easy to take this as a start point for accusations of social inadequacy in the IT community, but that would be unfair. There's a much deeper root impulse behind those who seek escape in IT. It's the same one that makes some people turn to religion – a need for transcendence.

Before you accuse me of making connections where none exist, just think about some of the forces behind IT evolution. You're probably thinking that IT was created to perform certain material tasks, and that it has no connection to any kind of deeper philosophical issues, but this couldn't be further from the truth. Some shareware proponents believe that the free software initiative, which spawned the increasingly popular Linux, leads a very deep social movement towards community.

Similarly, much of the thought behind computers stems from cybernetics, which has very spiritual roots in those who were behind the original theories. Norbert Wiener, who coined the term cybernetics from the Greek for 'steersman', may have been a mathematician creating systems for things like missile guidance, but Gregory Bateson, among others, studied social science. He was an anthropologist whose concern lay with the more human aspects of self-monitoring systems. Computers, far from being mere tools to perform a task, are an attempt to understand and mimic human thought – even a \$1,500 budget Celeron PC. So perhaps it isn't surprising that many enthusiastic users treat their computers like children, watching them mature through the addition of new peripherals and software.

Operating systems such as Unix, which are incomprehensible to mere mortals, reinforce the idea that IT managers operate

on a higher plane than the rest of us. Certainly, if the way a system works is hard to understand, if you can make sense of it you will look all the more special – IT gurus have a similar status to that once enjoyed by tribal巫医 doctors. But complexity brings more than just an opportunity for people to demonstrate how knowledgeable they are. It often brings customisability as well. Linux in particular, with its open source origins, can be customised just the way you like it. It's your world, even more so than a Windows environment. Not only can you change your Desktop theme, you can change your entire GUI, choosing to run any one of a number of different versions of X-Windows, the K Desktop Environment (as seen in Caldera's OpenLinux) or the forthcoming GNOME (the 'official' Linux GUI). In other words, Linux lets you treat your PC more like a

of transferring their expertise to the platform.

There has been some effort from the key Linux distributors, such as Red Hat and Caldera, to make Linux easier to install and use. However, it's still an OS that only very technically able people should even attempt to run. Linux commands are rather like magic spells, requiring precise, complicated syntax. Monitoring processes are called 'daemons', in yet another allusion to realms of fantasy. It's a difficult operating system but, despite scoring badly on the ease of use front, Linux spells the future in many ways. Apart from being free, it's very much an OS aimed at a networked environment.

Over the first decade of PC history, the computer was essentially a standalone box. It changed the structure of business somewhat, but that was only the beginning. Now that the PC has become firmly

ensconced at the centre of the digital communications revolution, a much bigger social revolution is underway. Can you imagine doing business without email? At *PC @uthority*, we receive all of our freelance copy and numerous news wires via email, so when it goes

down we're seriously crippled. The reliance of almost every corporation on connectivity is set to snowball as credible wireless information networks like 3Com's Palm.Net and smart Symbian cellphones arrive on the scene. Add to this higher bandwidth home connections and e-commerce, and computers become the gateway to a wide variety of social interactions that you either used to do differently or not at all.

None of these innovations would have existed without people believing in the magic of digital technology. Although there are still computer illiterates at high levels of management in lots of corporations, their days are numbered. The future of business is thoroughly entangled with IT. Anyone who doesn't have a vision of the spell computers can cast on an industry could find their company's profits turning to salt.

## 'IT GURUS HAVE A SIMILAR STATUS TO THAT ENJOYED BY TRIBAL WITCH DOCTORS'

living organism than Windows ever could.

This isn't the only reason why Linux's growing importance is significant. In an environment where HP and SGI have announced that they will pre-load the OS onto Intel-based systems, and numerous other vendors have pledged hardware support, you can see hints of a change in society and the whole system of money. We're all beginning to realise, via buzzwords like TCO (total cost of ownership), that service and support are far more costly than the hardware and software units we purchase. Linux just hammers this home with a steel mallet. The software costs nothing, and the hardware requirements are less hungry than Windows NT. This focuses all expense on running costs. As a reputedly stable platform, Linux should be cheap to maintain once it's up and running. Even if it does fall over, there's a ready supply of Unix experts capable



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# HORIZONS

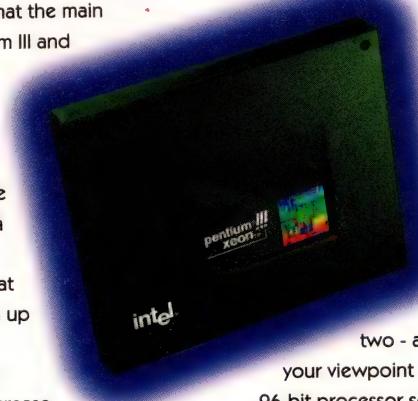
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## New Xeon on the block

**W**hile the controversy continues to rage about the Pentium III privacy issue, Intel is ignoring the cries of outrage and pushing on with its revamped processor range, finally lifting the lid on the new Pentium III Xeon processor. Many analysts believe that the main difference between the so-called mid range Pentium III and high end Xeon is the price tag, but Intel believes that the new processor is a vast improvement over previous models.

The most obvious difference is an increase in clock size to 500 and 550MHz. Just underneath the plastic case of the processor, however, things get a lot more interesting. Cache size comes in an impressive 512k, 1Mb or 2Mb, and the cache runs at the same speed as the processor core. The beefed up cache is complimented by Dynamic Execution for running instructions out of order, and an improved pipeline design and multi-branch prediction to decrease pipeline stalls.

The new Xeon also benefits from the streaming SIMD instruction set, a collection of 70 new instructions aimed firmly at producing high end multimedia content for the Web and other visual tasks. The Single Instruction Multiple Data set allows up to four floating point operations to be performed concurrently, very handy in 3D or other computationally intensive and



repetitive tasks, as well as further streamlining cache access. Finally, the PIII Xeon allows certain streaming media types to bypass the L2 cache altogether.

MPEG 2 and other video and audio streams commonly do not need to use the secondary cache, and these particular instructions allow data to stream directly to and from memory.

The SIMD instructions are useless without optimised software, but a number of vendors are already rushing to comply with the new set. Adobe, Discreet Logic and Autodesk are all producing software for the new processor, and high end graphics card maker Evans and Sutherland is looking to produce hardware with SIMD in mind.

As to system scalability, the processors support both two- and four-way systems. Unfortunately, depending upon your viewpoint on the matter, the Pentium III Xeon also shares the same 96-bit processor serial number. Ostensibly, this number is meant to allow system administrators to keep better track of hardware, and to assist in providing more secure online commerce, but privacy advocates fear that the identifier could be put to more nefarious uses. At the time of writing, the US Federal Trade Commission, which just settled one deal with Intel over abuse of its power in the processor market, may be looking into the privacy issue.

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## Welcome to Geyserville

**H**aving now implemented the Pentium III in both the desktop, workstation and server ends of its processor range, Intel has continued to move onto other areas. Never content to rest on its laurels, the giant chipmaker has turned its attention to the mobile processor, and has unveiled the curiously code-named Geyserville technology at a recent developer conference in the US.

Notebook processors have been slowly approaching desktop speeds for some time now, but the Geyserville processor is expected to take things right up to the wall, thanks to a new 'dual state' technology. When plugged into a wall socket for desktop use, the processor runs at its full frequency of 500MHz. Unplug the notebook and revert to battery power, and the processor slows down to 400MHz. Robert Jecmen, vice president, Intel Architecture Business Group, and general



manager, Mobile/Handheld Products Group, expects great things from Geyserville.

'The performance capabilities of future Intel mobile Pentium III processors enabled with Geyserville technology, combined with the power and performance benefits of the 0.18 micron manufacturing process, will mark the beginning of a new era in mobile computing,' said Jecmen. 'Delivering increasingly more performance is one of the key factors that will fuel the continued growth of the mobile PC market segment.'

Other news from the Palm Springs conference is that Intel expects to put a PIII/600 processor into a notebook by the end of the year. The mobile PII will also see a boost up to 433MHz, using a .18 micron manufacturing process, around the middle of the year.

It was already Australia's most popular printer for home and small offices. And now it's even better value than ever.

**Use 75% less ink.** Super Economy mode reduces ink consumption by 75% compared to Standard mode, and works for both black and white and colour. Combined with a high capacity, black ink cartridge, it can print up to 2400 pages in black and white, and up to 600 in colour using standard inks\*. That's anywhere from two to five times the output of any direct competitor!

**Fast B&W plus photo quality printing.** Then, there is a choice of high-speed B&W, or three colour print modes – Normal, Fine and Photo. Photo mode emphasises highlights and contrasts, and improves half-tones by producing a richer process black.



Brilliant colour, super economy, optional PhotoRealism, improved Internet printing,

# now all for just \$159.

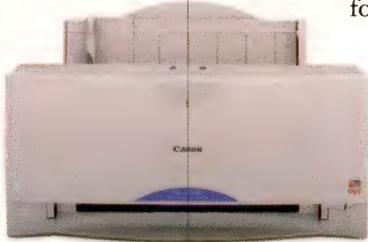
**Optional PhotoRealism™** To this Canon adds the option of PhotoRealism inks, for photographic reproduction approaching silver halide quality. By layering inks in up to four densities, it produces up to four times the colour combinations of conventional CMY printers, for smoother colour gradations and more accurate colours in skin tones and other light shades.

**Better Internet images.** Image Optimisation takes low resolution Internet images (typically 72 dpi), and prints them at the highest resolution supported by the printer to reduce jagged edges and pixelisation.

**Canon Customer Care.** All Canon printers feature a one-year warranty, upgradeable to three years for minimal cost, and are backed by Customer Care hot-line support. Drivers are available

for Windows® 3.1x/95/98 and Windows NT.

The BJC-255SP includes full capacity black and colour print cartridges, for just \$159. For more information call 1 800 021 167.



**BJC-255SP colour Bubble Jet™ printer – \$159<sup>RRP</sup>**

# Canon

\* Based on 5% page coverage, Super Economy not available with PhotoRealism inks. Price shown is the recommended retail price including tax. Canon and the Canon logo are registered trademarks and BJC, Bubble Jet and PhotoRealism are trademarks of Canon Inc. Windows is a trademark of Microsoft Corp. in the U.S. and other countries. Canon Australia Pty Ltd ACN 005 002 951 CS6012



## Clik! goes the drive

Iomega's new 40MB Clik! drive is expected to be incorporated into a number of handheld and mobile PCs in the near future. The small battery powered handheld drive, which takes a disk slightly larger than a 50-cent piece, has met with widespread acceptance from manufacturers of both portable computers and digital cameras.

Agfa has already incorporated the new mini disk into a digital camera to be released in the United States in May, while more than 20 OEMs and 18 industry leaders including Kodak, Microsoft, Hewlett-Packard, Polaroid and Motorola have said that they will support the technology.

Included in the list are several manufacturers of handheld PCs who are expected to make their products connectable to Clik! drives.

But the usage is not confined to computers and digital cameras. Iomega is hopeful Sony, Nintendo and other entertainment companies will adopt the technology.

Iomega's Country Manager for Australia and New Zealand, Peter Dawson,

said Clik! is ideal for downloading MP3 music files from the Internet, and talks were under way with a number of companies including Sony Music to use them in devices such as Walkmans.

He said MP3 files downloaded on to a Clik! disk could be encrypted so they could not be copied, making them ideal for companies that wanted to sell music or games over the Net. Sharp, Saehan and Varo Vision have already indicated that they intend to use Clik! for storing and playing audio files.

Clik! drives were launched in Australia in April and come with a Flash card reader that allows digital camera users to download graphics without having to connect to their PC. The disks retail for \$22.95 each and are sold in two or 10 packs. The drives, which come with a desktop battery charger, retail for \$599 for the digital camera kit or \$699 for a drive capable of linking to a laptop as well as the digital camera.

[www.iomega.com](http://www.iomega.com)



## Lotus launches R5 at Fusion

Although Lotus Domino Release 5 was officially released several months ago at LotusSphere in the US, the first official Australian launch took place at the beginning of March 1999 at Lotus Fusion. Release 5 is packed with many new features which Lotus claims will cement its leading position in the messaging and groupware market.

Sporting a new look and feel, Release 5 is designed to be the central repository of corporate information since email, calendaring, scheduling, news and Web browsing are all supported from within the Notes client. This integration allows users to perform genuinely useful tasks such as group calendaring (seeing everyone's calendars on the screen simultaneously), email Web pages (complete with all embedded images, Java and hotlinks) and quickly access information from the Web through 'portals' (provided by AOL in conjunction with Lotus). New filtering and rules agents automatically check incoming email (on the server) and either file it, delete it or prioritise it before sending it to the client.

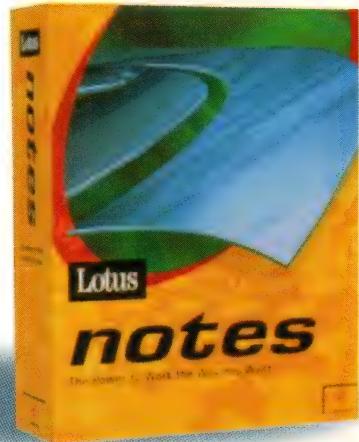
The Domino server is beefed up and allows between three and five times as many simultaneous users on the server without upgrading

hardware. Lotus also claims that Domino databases can now be of infinite size... 64Gb has been tested and there is a bounty for beating that limit! The Domino search engine has been enhanced, providing full text searching of all databases and files, allowing users to quickly find information wherever it is located.

For the 'big boys', the Enterprise Server version supports multi processor servers, automatic load balancing for both Notes and Web functions and automatic failover, which instantly redirects users to another server if their server fails.

Also launched were new products to allow geographically dispersed companies to collaborate on projects in real time. Sametime is an enhanced Web groupware tool that supports real time chat, awareness services (who else is online and what are they doing), IP audio and video, shared applications and whiteboard. A special enhanced version of Sametime, called LearningSpace, is also available specifically for conducting training courses.

[www.lotus.com](http://www.lotus.com)



Lotus

notes®

# An incredible list of features, at a stunning new price, in a full sized printer.



It can cut ink consumption by 75%, be used as a scanner, improve printed images down-loaded from the Internet, or even print banners. And this is in addition to better colour for plain paper, PhotoRealism inks for the gold standard in photo quality printing, plus super fast B&W!

**Better operating economy.** Super Economy mode reduces ink consumption by 75% compared to Standard mode, and works in both black and white and colour. It can print up to 3600 pages in black and white, and up to 400 in colour!

**Better on plain paper.** Another feature is Canon's Drop Modulation Technology with dual drop sizes for smoother colour gradations. It is designed to produce better looking colour on plain paper, which also helps keep operating costs down.

**The PhotoRealism gold standard.** When quality is most important, there is the option of Canon PhotoRealism inks. They vary the saturation per pixel so that a single dot

could have 0%, 33%, 67% or 100%. This produces up to five times as many colour combinations as conventional CMYK

inks, with better half-tones and almost no visible grain, even in areas of low colour density.

**High speed blacks.** A high-speed black ink cartridge with 128 print nozzles is included with your purchase. It is capable of speeds up to 510 characters per second (4.5PPM).<sup>2</sup>

**It's even a scanner.** The optional IS-22 scan head allows you to turn your printer into a colour scanner in seconds. It scans colour images up to 360 dpi and offers high speed B&W scanning for fax, OCR and copying functions.<sup>3</sup>

**Canon Customer Care.** All Canon printers feature a one-year warranty, upgradeable to three years for minimal cost, and are backed by unlimited hot-line support.

The BJC™-4310SP. Everything you could ask for in a printer, and a little more. For more information call us on 1800 021 167.



**BJC-4310SP colour Bubble Jet™ printer – \$239<sup>RRP</sup>**

**Canon**



## Toshiba slim down

**M**obile PCs are about to get lighter and more powerful at the same time, while providing new ways of communicating with other devices. Toshiba will introduce a new lightweight magnesium alloy casing mid year that will allow it to reduce its slim Portege models to less than a kilogram. The smaller models are expected to weigh in at around 850 grams.

The magnesium alloy cases are a third of the thickness of the current toughened models, but are twice the strength and not expected to add anything to the price. Later in the year Toshiba says it will start to introduce new technology that allows it to offer up to 20Gb hard drives and up to 1Gb of RAM capacity.

While most models will come standard with 64Mb to 128Mb of base memory, the use of new RAMBus Memory Modules will give them a capacity of up to 1Gb. Hard drive storage will increase through the use of newly developed Giant Magneto Resistance Head (GMR) technology.

National Marketing Manager for Australia and New Zealand Mark Whittard says the increased capacity will come without a noticeable price increase, which is good news for the budget conscious who need to carry large amounts of data with them.

[www.toshiba.com.au](http://www.toshiba.com.au)



## Dell and IBM lead the way

**T**he recent \$US16 billion dollar coming together of IBM and Dell marks one of the biggest technological pacts the computer manufacturing industry has ever seen. Over the next seven years Dell has agreed to purchase 'storage, microelectronics, networking and display technology from IBM for integration into Dell computer systems'. Industry experts believe the alliance has the potential to transform the arena of PC system manufacturing and sales.

Dell's enormous growth rate of roughly 50 per cent for each of the last two years means it requires a component supplier that can keep up. Having traditionally assembled its products from a number of outside sources, Dell now needs a more efficient way of coping with demand. IBM has already indicated its desire to move away from the PC market to

## Savage battle looming



**C**ompetition in the graphics card market is set to explode with a host of major players readying next-generation technology for production.

Graphics chip maker S3 has announced plans for a new product based on the forthcoming AGP4X (accelerated graphics port) standard. Matrox, nVidia and ATI are also expected to launch products based on the new specification.

Intel claims the new specification will be twice the speed of the current AGP2X standard. 'It's frightening. There will be [graphics] boards in the mid-range that are miles ahead of today's high-end boards,' says Neil McGuinness, PR Manager of graphics and multimedia manufacturer, Diamond Multimedia.

S3's Savage4 architecture will include DX6 texture compression as well as support for Pentium III and AMD K7 processors, which the company claims will boost 3D graphics performance. Savage4 will also include support for digital flat panel displays.

S3 claims to have the edge on its competitors thanks to its closer relationship with Intel, which gives the company access to Intel intellectual property. However, industry insiders believe nVidia's forthcoming TNT2 product will rule the roost. 'TNT2 will certainly be the best board around by far,' says McGuinness.

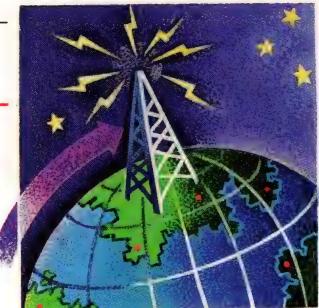
Matrox, nVidia and ATI are all keeping details of their products under wraps, but final products are expected to ship along with S3's in Q3. The Savage4 will be priced at \$US25 in quantities of 10,000 units.

concentrate on growing OEM business, and by becoming its 'in-house' hardware supplier it will be able to focus on other growth areas.

More and more large corporations are following IBM's lead and looking to other non-PC areas such as services and software in order to boost revenue. Hewlett-Packard recently announced that it would be creating a spin-off division for testing and measurement.

But as a result of this recent match several of Dell's previous suppliers are at risk of being put on the shelf. Following the announcement, disk drive manufacturer Maxtor has been heavily losing out on Wall Street. Seagate Technology and Data General are also speculating as to the future of their supply agreement with Dell.

Investors will have to watch and wait.



## IN BRIEF

### Oracle fund

Oracle has created a \$US100 million venture fund designed to promote innovation among companies developing products and services for its Oracle8i platform. The company hopes that the fund will encourage the creation of Internet products, focusing on e-commerce, content management and business intelligence.

### Just watch me

Casio has launched the world's first wristwatch with built-in Global Positioning System (GPS) technology. The watch will be able to instantly plot your current location on a standard map by receiving data from the 27 global GPS satellites. However, battery life is restricted to 3.4 hours when taking continuous readings. The GPS watch will be targeted at outdoor sports enthusiasts.

[www.casio.com](http://www.casio.com)

### It's a bug's life

American software bug-buster, BugNet, has decided not to present its annual award for the best bug fix performance because none of the major vendors came up to scratch. The 1998 award will be left on the shelf because 'the PC software industry's performance has been abysmal', according to a company statement. BugNet claims that bug fix rates have declined with every new version of Windows.

[www.bugnet.com](http://www.bugnet.com)



**Canon BJC-80**  
**\$399<sup>RRP</sup>**

**Canon BJC-50**  
**\$699<sup>RRP</sup>**



Advanced colour, cable-less communications, optional scanner plus two sizes that are

# Small and smaller!

Canon has a wonderfully new idea for people that need a portable printer. A choice.

On the small side there is the BJC™-80. It is a fraction of the size of the BJC™-100, yet it can handle up to 80 pages per minute. The BJC™-80 is the first printer to use Sharp's unique Drop Modulation Technology. This technology allows the printer to drop the ink droplets at different times during the print cycle, creating a wider range of tones and a more vibrant image. The BJC™-80 is a great choice for small businesses or individuals who need a reliable and efficient printer.

briefcase. Yet, with its in-built sheet feeder and power adaptor included as standard, it is designed for people who have to produce high volume output from a very small printer.

Conversely, if size is critical, there is the brand new BJC-50 with in-built battery. It's not just small, at approximately half the size of the BJC-80 it's absolutely tiny.

Equally impressive, their performance is as big as their size is small.

Using Canon's advanced Drop Modulation Technology™ you can print everything from colour charts, to high quality photographs. Or, in seconds you can convert to extra high white for finished business documents using the cartridge with 128 print nozzles!

For greater portability, both models include an infrared port for totally cable-less communications with any suitably equipped Windows® 95/98 notebook or PC.

And, if you really need the functionality of an office in the space of a briefcase, both models will accept an optional colour scanner head in place of the print head. It takes only seconds to change the

heads. You can then use the scanner head to acquire colour images, or for fax and OCR functions.\*

The BJC-80 fits in approximately half the space of a briefcase. The BJC-50 is approaching 50% smaller still.

#### Optional colour scanner.

**Canon Customer Care.** All Canon printers feature a one-year warranty, upgradeable to three years for minimal cost, and are backed by Customer Care hot-line support. Drivers are available for

DOS, Windows 3.1x/95/98 and Windows NT.

If you need help choosing between small, and smaller, give us a call on 1 800 021 167.

# Canon portable colour Bubble Jet™ Printers

# Canon

Prices shown are recommended retail prices including tax. \*Scanner-head works with Windows 95/98 only. Fax and OCR software not included with purchase. Canon and the Canon logo are registered trademarks and Drop Modulation Technology, Bubble Jet and BJC are trademarks of Canon Inc. Windows is a trademark of Microsoft Corp. in the U.S. and other countries. Canon Australia Pty Ltd ACN 005 002 951. CS6019



## Cyber crooks hack Pentagon

Hacking caused over \$US100 million dollars in losses last year in the United States alone and the world's security and telecommunications systems are constantly under threat, according to a confidential briefing made by US Deputy of Defence, Secretary John Hamre, to the House Armed Service Committee in February. He spoke of a 'new breed' of computer hacker, a cyber crook capable of reaching the Pentagon systems up to 100 times a day.

Hamre spoke of 'Solar Sunrise', a series of widespread and systematic attacks on US defence networks that occurred in February 1998 during the crucial preparations for military operations against Iraq. The attack triggered President Clinton's call to arms against cyber terrorism, his main concern being that the 'enemy' not only has cheap and easy access to the same powerful technology as

intelligence agencies, but also an increased knowledge of how to use it.

Pentagon security officials claim that new forms of attack are penetrating the US Defence detection threshold at the alarming rate of one every hour. And, of the 80-100 hacker 'events' that occur each day, one in ten are investigated. Some of the most recent attacks are reported to be coming from Russian computers.

Last month a British Skynet Satellite was allegedly re-aligned by hackers who then demanded money to discontinue their interference.

Security sources commented that 'This is not just a case of computer nerds mucking about. This is very, very serious'. However serious these 'War Games' are, President Clinton is taking no chances. \$US1.46 billion dollars of taxpayer money is what he will use to protect the people from what he calls, 'freedom's enemies'.



## Gateway's new powerhouse

While Steve Jobs has declared that the floppy disk is dead and did not include one in the iMac, Gateway has hedged its bets by including a 1.44Mb floppy AND a CD rewriter in its new Pentium III PC. Gateway's new G7-500XL includes a Philips Recordable/ReWritable CD-ROM as standard equipment, giving users 640Mb of portable storage capacity. However, customers can request a 100Mb Zip drive instead if they prefer something a little quicker.

Gateway first offered a CD rewriteable in its top of the range machines a couple of years ago but discontinued it two months later due to problems with performance and stability of the CD-R unit. The company says it is now satisfied that it is time to try again and the response to date has been positive. But the CD burner is not the only goodie included in the \$5,600 500XL package.

It is powered by a 500MHz Pentium III with a 512K L2 cache and comes standard with 128MB of SDRAM. The Ultra ATA hard drive has a massive 18Gb capacity and there is a DVD-ROM drive, which comes standard throughout the G7 range.

Gateway has upgraded the graphics capacity by incorporating a 16Mb nVidia TNT AGP graphics card, and rounded off the package with a 19in monitor and Boston Acoustics Digital Media Theatre speakers.

Storage capacity has been treated as a major issue throughout both the G7 and GP7 professional range with all models having at least a 12.9Gb hard drive. All of the G7's come with a 56k data/fax modem as standard equipment.

www.gw2k.com.au

## Quick fix

A Brisbane company has developed a Y2K solution for PCs that does the obvious - it replaces the cause of PC's Y2K problem, the realtime clock.

The Micro Y2000 Date Correction card fits into an 8-bit ISA slot and has been designed to override the motherboard's CMOS realtime clock (RTC), which is the root of the hardware problem in PCs.

The card overrides the PC's RTC at boot up and corrects the date. It's a major benefit for home and small business users, retails for less than \$200 and can be used in any PC motherboard from XT up, thus eliminating the need to replace an old PC just because it is not Y2K compliant. It also takes only a few minutes to install.

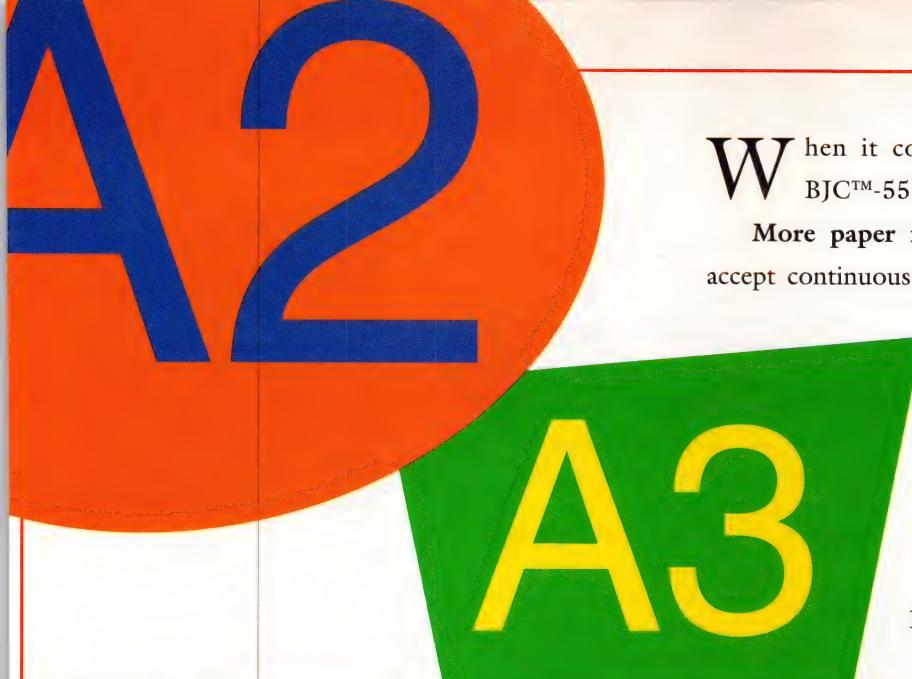
Managing director of Micro Y2000, Paul Fulloon, says although the idea behind the card was simple, it had taken 18 months to perfect so it would work in any motherboard.

'It sounds stupid when you see how simple the solution is, but there has been a lot of pain getting it completed because the PC architecture is not standard,' he said.

Mr Fulloon went on to say that software solutions did not actually change the clock, they just redirected calls that applications make to the clock. But major problems occurred if three or more applications attempted to access the date at the same time.

'Operating systems such as UNIX directly interrogate the physical clock, and in doing so will get the wrong date. The card tells the physical clock what the real time is so that it reports the correct date,' he said.

www.microy2000.com

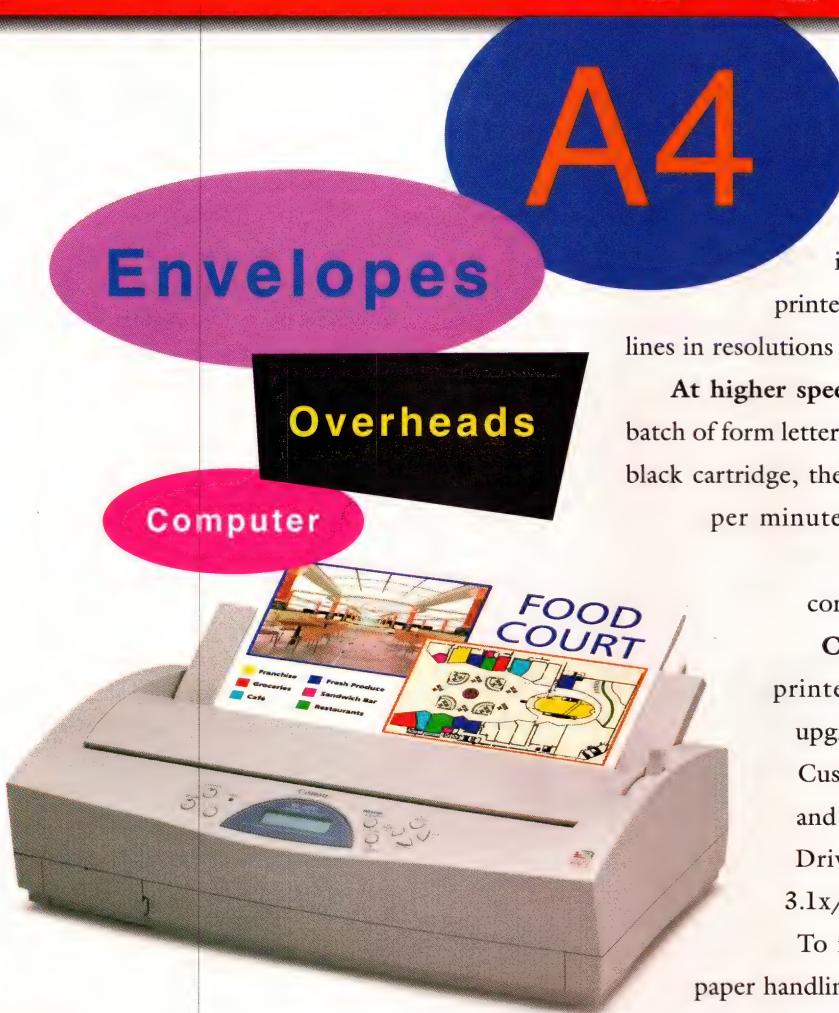


**W**hen it comes to superior paper handling, the BJC™-5500 has no rivals.

**More paper feeds.** It comes with a tractor feed to accept continuous form (computer paper), a manual feed and an automatic feed for cut sheets up to A2, or envelopes. To this you can add two optional cut-sheet feeds so for instance, you could have letter-head and standard paper feeds at the same time.

**To do more jobs.** Obviously the BJC-5500 has the paper handling for

The Canon BJC-5500 can do something that no other printer can, print more paper types.



almost every one in the office from accountant to artist, and engineer to receptionist. Its appeal is further broadened by the fact that the BJC-5500 is also an exceptional four-colour CMYK printer capable of producing text and graphic lines in resolutions up to 720 dpi.

**At higher speeds.** Whether it's a long spreadsheet, or a batch of form letters, the BJC-5500 delivers. Using the special black cartridge, the BJC-5500 prints close to 7 B&W pages per minute in high speed. It even offers an ultra efficient Economy Mode that reduces ink consumption by 67% vs. High Quality mode.

**Canon Customer Care.** Like all Canon printers it features a one-year warranty, upgradeable to three years, and is backed by Customer Care hot-line support. Both colour and B&W cartridges are included as standard. Drivers are available for DOS, Windows® 3.1x/95 and Windows NT.

To find out more about Canon's exceptional paper handling capabilities, call us on 1800 021 167.

**BJC-5500 colour Bubble Jet™ printer - \$1499<sup>RRP</sup>**

**Canon**



## Award winning IT

The IT&T awards currently run in Queensland, Victoria and Western Australia are about to go national, and then international. Under a deal struck between the Malaysian government and the Queensland-based organisers of the awards, countries throughout the Asia-Pacific region will be invited to compete in the International IT Olympics.

Malaysian Prime Minister Dr Mahathir Mohamad is to be the founding chairman of the International Asia-Pacific Information Technology and Telecommunication Awards that will be open to companies and individuals throughout Australia, Malaysia and APEC countries. Brunei has already agreed to participate.

The awards are seen as a major boost to the Australian IT industry and are expected to open major opportunities in Asia, particular in relation to the \$US19 billion Malaysian Multimedia Super Corridor. Under the agreement, Asia-Pacific Information Technology and Telecommunications, which organises

the Queensland awards, will assist the Malaysian Multimedia Development Corporation to stage Malaysian awards this year.

They will then work towards staging an event that covers the entire Asia Pacific region at a time and date yet to be decided. Winners from regional awards throughout Asia-Pacific will participate in the international event. APIT&T already organises awards in Victoria and West

Australia, and hopes to bring all Australian states into the plan. APIT&T Chairman Paul Phillips said Dr Mahathir was particularly keen to

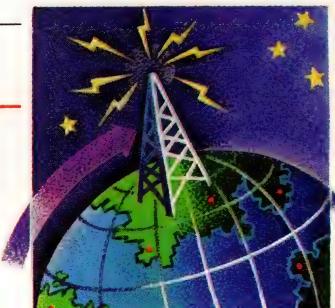
develop an IT&T relationship with Australia and it was hoped he would visit Queensland later this year in his new role as patron of the awards.

'The Malaysians intend to use the relationship established with Australia through the awards to do trade, technology transfers, student exchanges and so on,' Mr Phillips said.

[www.itawards.com](http://www.itawards.com)



## ASIA-PACIFIC



## IN BRIEF

### Activists fined

Anti-abortion protesters behind a 'hit list' style Web site have been fined \$US107 million by a US court. The site featured the names, addresses and photographs of abortion doctors, labelling them 'baby butchers'. The execution of three doctors resulted in their names being crossed off like items on a shopping list. The activists claim they were merely storing details in preparation for trials against the doctors for acts against humanity.

### Security slackers

Nearly half of all corporate users use the name of their partner, children or pets as a password for their system, according to research by Datawise. Of those surveyed, 15 per cent chose their date of birth, while 20 per cent of men opted for the name of their favourite football team.

### Power up

Lithium Technology promises to banish laptop battery blues with a new lithium ion battery that lasts for over ten hours at 9W, about five times that of today's batteries. The battery is currently in beta and won't be ready for commercial production until next year.

### On the move

Netscape co-founder Marc Andreessen is to become Chief Technology Officer at AOL. The move is dependent upon regulatory approval of AOL's recent \$US4.2 billion acquisition of Netscape.

## Masterminding better machines

Machine intelligence is catching up with that of humans with a Japanese project to create the world's most intelligent artificial brain.

Like the human brain, the Japanese team's electronic brain is self-evolving in that it grows electrons to mimic the brain's complex neural structure. The team has already created a brain with 10 million artificial neurons, making it the world's most advanced artificial intelligence to date.

Now the team is hoping that it can build on this achievement by creating a brain with a billion artificial neurons by the year 2001. 'One century from now I see humanity being replaced by massively intelligent machines,' says Hugo De Garis, the brain's inventor.



The CAMBrain project uses cellular automata (CA) as building blocks to grow and evolve neural network circuits, each of which is stored in as little as two bytes. The next step is to use evolvable hardware (the CAMBrain) for brain building, which grows neural circuits in nanoseconds. The CAMBrain is capable of updating 100 billion CA cells per second.

An early incarnation of the brain will most likely appear in artificial pets. The team is working with Genobyte to create an intelligent robot kitten called Robokoneko with a 10,000 neural net module artificial brain. The kitten will be controlled by an on-body radio link to the 80Mb artificial brain. 'The idea of building robo pets has already taken off in Japan,' says De Garis.

PC Authority will keep you posted on any further developments.



## Mirror, mirror...who's the clearest of them all?

The screens of AcerView Professional series monitors are clearly ahead in the market.

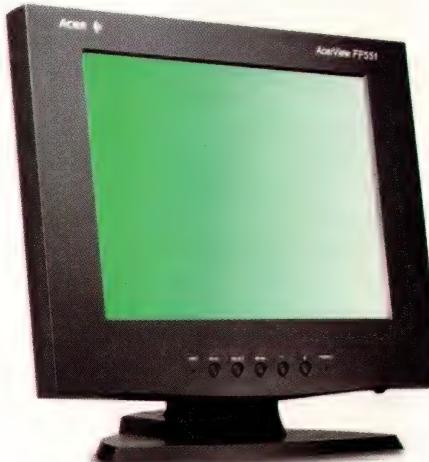
Each offers sharper images, richer colours and exceptional centre-to-corner focus.

While the colour matching embedded in the software and colour temperature adjustments means what-you-see-is-what-you-get (or WYSIWIG).

### They're good for your image.

The 19" (18" viewable) 99c and the 21" (20" viewable) 211c are the perfect choice for professionals looking for a larger working environment as well as images with high contrast.

Featuring an anti-static and anti-reflection coating, as well as flat square screens, these monitors offer best image



quality and the maximum possible display area.

Our monitors also share the two lens design which guarantees reduced colour bleeding and moiré. You also enjoy increased image focus and spot roundness.

### Headache-free.

All our monitors come with high refresh rates, offering images that are both flicker-free as well as headache-free.

They're PC compatible and extremely easy to use. They also meet the most stringent of environmental standards.

And they offer the option of the Universal Serial Bus (USB) which gives you a greater degree of freedom in connectivity. While our "i key" technology simplifies monitor settings with

easy-to-use, auto-sizing features.

All AcerView Professional series monitors carry our 3-year, limited on-site warranty (our LCD warranty is one year, return to base).

If space is at a premium, the AcerView LCD monitors use 75% less desk space and are lightweight into the bargain.

So, when you look at our monitors versus the competition, you'll find they look better by the minute.

For more details take a look at [www.servex.com.au](http://www.servex.com.au)

**Acer**   
**Peripherals**

**servex**  
service for excellence

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\* 3-year on-site limited warranty applies to AcerView Professional series monitors only. AcerView LCD monitors carry a 1-year return-to-base warranty. Servex Australia Pty Ltd ACN 076 483 808. Acer and the Acer logo are registered trademarks of Acer Inc. All other product, brand and company names are trademarks of their respective owners.

SERV/5723.



# GOING, GOING... GONE?

Want to buy Windows? I mean, all of it? An auction of the entire license is just one of the possibilities in the antitrust case to end them all.

**E**ven though the momentous clash of titans that is the Microsoft antitrust case has gone into recess, the rumours and reports continue to flow out of Redmond and Washington. Perhaps not unsurprisingly, representatives of Microsoft met with the Department of Justice to nut out a possible settlement to the case.

Proposals have been made and rejected, and it's anyone's guess just what will happen, but all agree that a settlement may be the best thing for everyone. As many legal observers agree, a settlement is almost always faster than letting the courts regulate a result.

The DOJ received an initial proposal in late March, which was rejected out of hand.

Prosecutors discussed the document in a conference call, and almost uniformly agreed that the proposal was flawed and inadequate. Details of the proposal itself are non-existent; Microsoft wants to make sure the settlement process is entirely confidential. It is known, though, that part of the proposal was to make changes to the manner in which Microsoft licensed its products to other companies, but these were obviously not drastic enough for the DOJ. A number of other options have been posited as acceptable to the prosecutors, but as the initial settlement talks have been inconclusive, the matter will more likely continue in court on the 10th of May, when the trial recess ends.

Auctioning off Windows licensing is a popular option for trustbusters, giving the rights to circulate and develop the Windows OS to three or four different companies. Another answer on the mind of the DOJ and the 19 prosecuting states is to force Microsoft to open a portion of the Windows code itself. Both outcomes will bring Windows far closer to the Linux model of free software than many analysts would have ever thought possible, but it would certainly stop any further monopolistic actions on Microsoft's behalf. The only thing that would need to be taken care of is making sure that the prospective Windows flavours were interoperable - nobody wants this case to lead to further platform clashes than already exist in the computing world.

Bill Gates has been quite vocal about what he wants, and has been

since the trial's beginning. All that matters to the richest man in the world is retaining the right to introduce further innovations and functionality to the Windows desktop. When it comes down to it, opening Windows or selling it off to others will not change Microsoft's rights at all, but it will mean that there are alternatives to Windows as we know it, and that is the key thrust of the entire anti-trust charge brought by the DOJ and its allies. Imagine a world where you actually have a choice between which Windows you use, and not just those provided by the different versions of Windows 2000.

At least one group of American IT executives has been polled on the matter, and they seem adamantly against any government intervention in Microsoft's business practices. The poll, conducted by Mason-Dixon Media Research on behalf of the Association for Competitive Technology, asked a number of what could be considered leading questions concerning possible breakups of Microsoft or the licensing of Windows to other products. The poll is online at <http://www.competitive-technology.org/poll/poll.asp>, so make up your own minds. Nonetheless, it seems very curious that ACP's prime concern, to promote 'The freedom to achieve, to compete and to innovate...' is almost the same line that Bill Gates has been spouting about his concerns over the US government's actions.

Meanwhile, Microsoft has already begun to reorganise itself along entirely new lines, splitting itself into well defined groups based upon customer demand, not on products. The new divisions are the Business and enterprise division, the Consumer Windows division, the Business productivity group, the Developer group, and the Consumer and commerce group. Microsoft president Steve Ballmer says that 'This new structure is part of the re-invention of Microsoft,' but is adamant that the move has nothing to do with the ongoing trial. It is worth remembering the old saying of journalists and investigators everywhere: there is no such thing as coincidence. IDC are also sceptical of the reorganisation. 'If the entire 're-invention of Microsoft' proves to be simply a PR exercise intended to appease the DOJ, it could well backfire.'

Auctioning off Windows licensing is a popular option for trustbusters...

... Microsoft has already begun to reorganise itself along entirely new lines...

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# IT'S NOT JUST COMPUTERS

David Neiger looks at other devices, besides PCs, that may fall prey to the turn of the century.

Over the last two decades, computer chips and microprocessors have found their way into all sorts of devices including buildings, security and fire systems, telecommunications equipment and home appliances. Unfortunately, these devices (known as embedded systems) are not immune to the millennium bug problem.

Unfortunately, it is generally not possible to examine the code stored in embedded systems' chips to determine if the Y2K bug is lurking. Left to their own, these devices often cannot report an error (unlike a PC which will throw up a General Protection Fault or 'blue screen of death'), which means come 1 January 2000, the device may either stop, malfunction, go completely haywire, or continue on unaffected. The trouble that is no one knows which of these scenarios will affect which chip. The problem could be as minor as recording *The Nanny* instead of *The Simpsons*, or as serious as life support systems in hospitals failing or automated valves turning off the gas mains or power stations shutting down.

Much of the doom and gloom information about TEOTWAWKI (the end of the world as we know it) comes from the US, however, it is important to realise that US utilities are considerably different from those in Australia.

In the US, the utility market comprises thousands of players, some are large corporations with sufficient resources to tackle the Y2K problem while others are rural utilities with barely enough funds to keep functioning. The main concern in the US is that one of the smaller players may not become Y2K compliant in time and as a result impact on part of the supply chain and cause outages. If you have time, you can read details of the US situation in the US Senate Report which can be found at [www.senate.gov/~Y2K](http://www.senate.gov/~Y2K).

Unlike the US, most utilities in Australia are either largely state owned monopolies or have only recently been privatised. This means that these utilities control most of the supply chain (so they are less dependent upon others to get it right) and have sufficient resources to deal with the Y2K problem. There are other important differences too; it will be summer in Australia so people will not freeze to death and Australian water is generally drinkable, even without heavy chlorination. Whilst you may be re-reading this article by candlelight sometime in January 2000, I doubt that the lights will go out, nor will we drown in our own sewerage!

Given that Australia is unlikely to revert to the stone age, you need to take steps to ensure that your own embedded systems aren't bitten by the Y2K bug!



The first step is to conduct a full inventory of all of your embedded systems in your house, office and car. Note down the brand, model and serial number and if possible try to find out when you purchased it. You then need to determine if these devices are likely to be time or date sensitive. Whilst it is not possible to be absolutely sure, as a general rule, if the device has a clock or a battery backup, there is a good chance that it uses dates in some way.

Once you have your list of devices, you then need to either contact the manufacturer of the device (who is probably inundated with similar requests) or hit the Web to determine what impact Y2K has on the device. Make sure you match the model and serial number closely to the vendor information. This is because it is not uncommon for supposedly identical devices to contain different chips.

Whilst most devices will be unaffected (especially plastic cutting boards - see <http://www.Y2Kculture.com/reality/19990223.cuttingboard.html>), those that are affected will need to be either replaced or sent back to the manufacturer for a repair or upgrade. If you cannot obtain information about the device, and the device performs a critical function (such as running your office telephones or fire alarms) then the device should either be replaced or tested by a competent engineer or technician.

Under no circumstances should you test an embedded device yourself by winding the clock forward! This is because these devices often perform essential functions and winding the clock forward may permanently destroy the device or cause it to malfunction. Always leave testing of these devices to those with the proper qualifications.

Once you have rounded up and checked all of your embedded devices, you are well on the way to reducing the impact of Y2K on your life. But what if unexpected things go wrong? Next month we will discuss contingency planning... just in case.

David Neiger is one of Australia's leading Y2K consultants who advises government and business. He can be reached by email at [davidn@neiger.com.au](mailto:davidn@neiger.com.au) or via his Web site at [www.neiger.com.au](http://www.neiger.com.au)

# Say "cheese."

So, you got a digital camera. Cool. Very cool. But do you have film? Here's what we mean. Until now, you'd run around, take digital pictures, maybe 12 of them, and boom, you're done.



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# THE A-LIST

IF YOU ARE LOOKING TO BUY A PC, PERIPHERAL OR SOFTWARE PACKAGE, THEN LOOK NO FURTHER. OVER THESE THREE PAGES YOU WILL FIND THE BEST BUYS IN ALL CATEGORIES, ALL PROVEN WORTHY BY PC @UTHORITY

## DREAM MACHINE: Dell Dimension XPS-T500

What can we say? This is one of the first machines to enter our Labs featuring the new and much hyped Pentium III processor, running at a rather explosive 500MHz. Coupled with 128Mb of RAM, this is a true dream machine. A DVD-ROM plus decoder card, a 19in monitor, and an enormous sound system round out the feature set, along with an STB Velocity 4400 graphics card. Wow.

**PRICE** \$4,997

**SUPPLIER** Dell Computers 1300 303 148

**ISSUE** Recommended Award, April 1999, p85



## WORKSTATION: Dell Precision 410

At PC @uthority we appreciate a high quality machine almost as much as we appreciate raw computing power, and we found Dell's Precision 410 to be one of the most intelligently designed machines we've seen. Without the need for wrench or screwdriver to open the unit, getting inside is a breeze, and most of the peripherals can be mounted on a slide out rack for easy access. The power supply is hinged to let users easily upgrade RAM as well. All that and Pentium II/450 power.

**PRICE** \$8,251 single CPU, \$10,098 dual CPU.

**SUPPLIER** Dell Computers 1300 303 148

**ISSUE** Quality Award, March 1999, p54



## FASTEST CELERON PC: Beyond SuperO Velocity

Taking out the Labs Value Award for this month's Internet PC comparison, the Velocity not only represents excellent value for money, but claims the title of the fastest Celeron-powered PC we've tested to date. Taking advantage of Intel's latest cost-saving PPGA packaging for the new range of Celeron processors, the SuperO Velocity flies along at 400MHz. Packed with a host of quality peripherals, the Velocity is ideal for the home user.

**PRICE** \$2,480

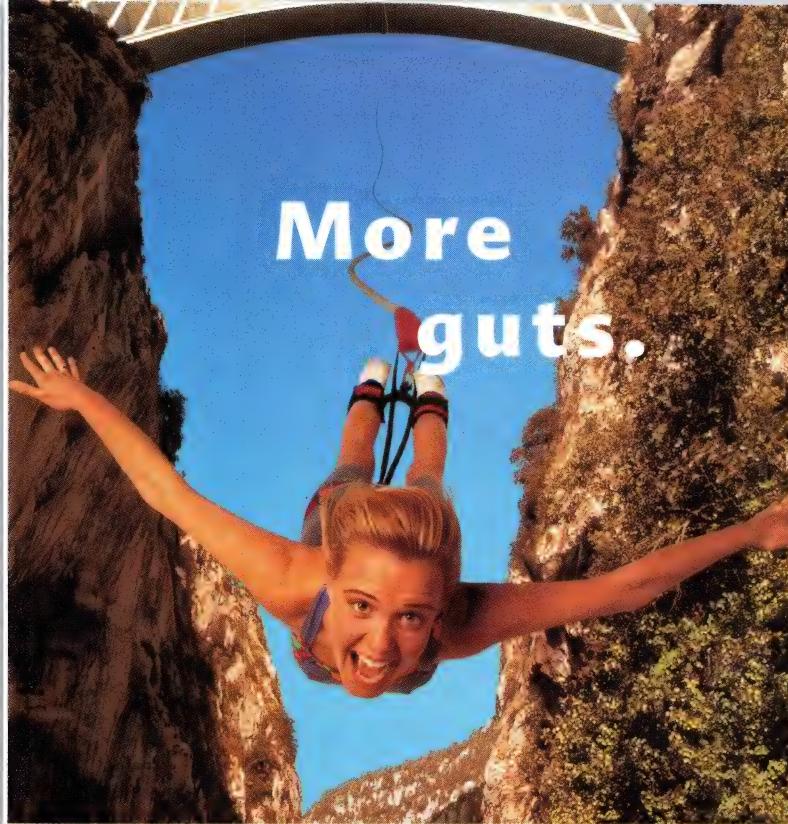
**SUPPLIER** Beyond Computers (02) 9417 3688

**ISSUE** Value Award, April 1999, p54



## ALL THE HOTTEST PRODUCTS AT YOUR FINGERTIPS

HARDWARE	PRODUCT	DESCRIPTION	DETAILS
• DREAM MACHINE	Dell Dimension XPS-T500	Not the fastest machine ever, but only by a small margin and with a dreamy feature set.	Pentium III/500, 512Kb L2 cache, 128Mb SDRAM, Intel 440BX chipset, 12.9Gb UDMA IBM hard disk, STB Velocity 4400 graphics card. Price: \$4,997; Supplier: Dell Computers 1300 303 148. Recommended Award, April 1999 issue, p85
• FASTEST PENTIUM II PC	Integral Prodigy Diamond XSI	Outstanding speed and stocked with peripherals, the Prodigy Diamond is a formidable machine.	Pentium II/450, 128Mb SDRAM, 8.7Gb Fujitsu Ultra2 SCSI hard disk, Asus 40-speed CD-ROM, Asus V3400NTN 16Mb AGP graphics card, 17in Prodigy monitor, Creative SoundBlaster 128, Juster 3D-128 speakers, Prodigy 56k modem, Asus 10/100Mbit network card; Price: \$5,445; Supplier: Integral Computers (02) 9476 0628; Speed Award, February 1999, p58.
• FASTEST CELERON PC	Beyond SuperO Velocity	Great level of standard equipment and a top performing processor rounds out an excellent home PC solution.	Celeron/400, 128Mb of SDRAM, 6.4Gb Quantum hard disk, 16Mb Leadtek WinFast 320 graphics card, 15in NEC MultiSync V500 monitor, Sound Blaster live! sound card, 56k modem, internal Iomega Zip drive; Supplier: Beyond Computers (02) 9417 3688; Value Award, April 1999, p54.
• WORKSTATION	Dell Precision 410	Superbly built with an eye to easy expandability, plus workstation power to spare.	Pentium II/450, 128Mb SDRAM, 9.1Gb Quantum Viking hard drive, 36Mb Evans & Sutherland AccelGALAXY 3D graphics card, 17in Dell 1000HS Trinitron monitor, integrated Crystal Audio 4237B sound chip, integrated 3Com 10/100 network card. Price: \$8,251 single CPU, \$10,098 dual CPU. Supplier: Dell Computers 1800 811 561. Quality Award, March 99, p54.
• MOTHERBOARD	SuperMicro P6SBA	A top performing and well featured motherboard.	Slot 1, Intel 440BX chipset, 1 AGP, 4 PCI, 3 ISA slots. Price: \$228; Supplier: BCI Technology (02) 9417 3688; Speed Award, March 99, p78
• FASTEST NOTEBOOK	Dell Inspiron 7000	A fully featured portable powerhouse for the user on the move.	Pentium II/300, 64Mb SDRAM, 3.2Gb hard disk, 14.1 TFT screen, 8Mb ATI Rage LT Pro graphics, DVD-ROM drive, weight: 3.9kg; Price: \$7,557; Supplier: Dell Computers 1300 303 273; Recommended Award, November 1998, p12
• CD WRITER	Hewlett-Packard CD Writer Plus 7200	Excellent documentation, quality software, and a good price make the HP a clear winner.	Internal CD-RW, 640Mb media capacity, EIDE interface, 768Kb cache, Adaptec DirectCD, Writer Plus 7200 Adob PhotoDeluxe, Corel Print House Magic, Digital Now Photo Organiser; Price: \$869; Supplier: Hewlett-Packard 1347; Quality Award, July 1998, p68.
NEW! • REMOVABLE STORAGE	ORB 2.2Gb Drive	High performance, low-cost means of backup and data storage.	2.2Gb EIDE disk drive, 25 MIPS DSP CPU, MR (Magneto-Resistive) head, quoted average seek time: 10ms read/12ms write, quoted maximum sustained data transfer rate: 12.2Mb/s; Price: \$399; Supplier: Business Bits (02) 9279 2424; Recommended Award, May 1999, p94.
• 3D GRAPHICS CARD	Canopus Pure3D II	A serious piece of gaming hardware, that any gamer with disposable income will want to buy.	3D graphics card, 3Dfx Voodoo2 chipset, 12Mb EDO RAM, composite and s-video output; Price \$449; Supplier: Innovision Technology (03) 9853 6387; October 1998, p77.
• 2D/3D GRAPHICS	Diamond Viper V550	Brilliant performance in both 2D and 3D earn the Viper a place in the A-List.	AGP 2D/3D graphics card, nVidia Riva TNT 128-bit chipset, 16Mb 125MHz SDRAM, 250MHz RAMDAC; Price: \$449; Supplier: Chips and Bits (03) 9696 1911; Recommended Award, November 1998, p82.



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More Virility, More Brains,  
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**MOVABLE STORAGE: ORB 2.2Gb Drive**

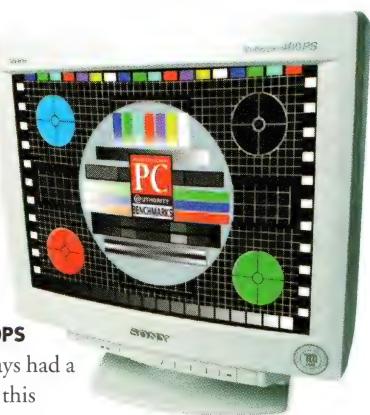
ving the likes of Jaz a good run for their money, the new ORB drive is an impressive entry into the removable storage market. courtesy of Castlewood Systems, the ORB employs magnetoresistive (MR) read technology to deliver the best cost-per-megabyte ratio we've seen in a removable disk. Combining ease-of-use and a high performance transfer rate, the ORB is a must-have peripheral for those in the market for a high-capacity backup device.

**PRICE** \$399**SUPPLIER** Business Bits (02) 9279 2420**AWARD** Recommended Award, May 1999, p94**3D GRAPHICS CARD: Canopus Pure3D II**

For the serious gamer, who cares nothing for price, but requires the ultimate in 3D gaming power, there is currently no other choice than the Canopus Pure3D II. With an average frames per second exceeding 100 in our 3D benchmarks, the A-Listing of the blisteringly fast Pure3D II never was in question.

**PRICE** \$449**SUPPLIER** Innovision Technology**PHONE** (03) 9853 6387**ISSUE** October 1998, p77**MONO LASER PRINTER: Xerox DocuPrint N40**

The Xerox DocuPrint N40 is without a doubt the fastest printer we've seen in a while, offering not only speedy printing but clean sp text to boot, and a low running cost. Even better, for a printer this spec the price is low, and you can expand further as your printing needs require.

**PRICE** \$8,418**SUPPLIER** Fuji Xerox (02) 9856 5000**AWARD** Excellence Award, December 1998, p83**19IN MONITOR: Sony GDM-400PS**

The PC @uthority team has always had a soft spot for Sony monitors, and this latest just proves the point. The GDM-400PS scored consistently high scores across the board in a very competitive Labs. Colours are crisp, text is clear but not painful, and resolution tops out at a very impressive 1,600 x 1,200 at 75Hz. Yes, the Sony is expensive, but you certainly get what you pay for.

**PRICE** \$2,799**SUPPLIER** Sony 1800 226 429**AWARD** Quality Award, October 1998, p64

HARDWARE	PRODUCT	DESCRIPTION	DETAILS
• BUSINESS GRAPHICS CARD	Matrox Productiva G100	A good 2D card for business users who have no need for fancy graphics.	AGP 2D/3D graphics card, Matrox MGA-G100 chip with 8Mb of SDRAM, 230MHz integrated RAMDAC. Windows 95 and NT4 drivers included; Price: \$270; Supplier: Focal Point Computing (02) 9925 0388; Recommended Award, June 1998, p87.
• MONO LASER PRINTER	Xerox DocuPrint N40	The fastest printer in town with an excellent standard specification, low price, plenty of expansion potential and high output quality.	600 x 600dpi monochrome laser, 40ppm print speed. Intel i960HD RISC processor, 24Mb memory expandable to 128Mb, parallel port, serial port, Ethernet 10Base2 and 10BaseT ports, PostScript Level 3, PCL6 emulation, CentreWare DP and PrinterMap management software, drivers for Windows 3.x/95/98/NT; Price: \$8,418; Supplier: Fuji-Xerox (02) 9856 5000; Excellence Award, January 1999, p83.
• COLOUR INKJET PRINTER	Epson Stylus Color 740	The Stylus Color 740 improves upon previous Epson printers in all areas of operation, including speed and quality.	1,440 x 720dpi four colour piezo-crystal inkjet printer; Price: \$599; Supplier: Epson (02) 9903 9000; Recommended Award, December 1998, p82.
• IDE HARD DRIVE	Seagate Medallist Pro	The first of a new breed of 7,200rpm IDE hard disks is quite simply the fastest non-SCSI drive tested to date.	Ultra ATA EIDE hard disk drive, 9.1Gb unformatted capacity, 7,200rpm spindle speed, 512Kb buffer; Price: \$555; Supplier: Agate Technology (02) 9878 4688; reviewed November 1998, p86.
• SCSI HARD DISK DRIVE	Seagate Cheetah 9LP	A blisteringly fast hard disk using the new Ultra2 SCSI technology.	9.1Gb Ultra2 SCSI (LVD) hd drive, 10,025rpm spindle speed, six platters, 5.2ms average read seek, 2.99ms average latency, 1,024Kb buffer; Price: \$1,605; Supplier: Agate Tech (02) 9878 4688; Recommended Award, June 1998, p91.
• PDA	Psion Series 5	Powerful apps and a quality keyboard make this an Award Winner.	4-8Mb RAM, 640 x 240 touch screen, CompactFlash slot, IrDA port, microphone, full set of apps; Price: \$1,295 8Mb; \$1,095 4Mb; Supplier: Vodafone (02) 9415 7777; Quality Award, February 1999, p80.
• SCANNER	Microtek ScanMaker III	Professional quality at a surprisingly affordable price makes the ScanMaker a worthy Quality Winner.	600 x 1,200dpi 36-bit cold cathode CCD, SCSI interface with supplied card, Caere OmniPage LE OCR software, Ulead PhotoImpact 4.0, Kai's PhotoSoap; Price: \$529; Supplier: Proscan 1800 654 930; Quality Award, January 1999, p71.
• SCANNER UNDER \$300	Canon CanoScan FB620P	Excellent image quality considering the low price. Only let down by its very slow scan speed.	600 x 600dpi 30-bit three colour CCD, Parallel interface, Caere OmniPage LE OCR software, Ulead iPhoto Express; Price: \$299; Value Award, January 1999, p67.
• 19IN MONITOR	Sony GDM-400PS	Amazing picture quality at a reasonable price, plus every feature you need.	19in Trinitron, 0.25mm grille pitch, refresh 1,600 x 1,200 at 75Hz; Price: \$2,799; Supplier: Sony 1800 226 429; Quality Award winner, October 1998, p64.
• DIGITAL CAMERA	Olympus Camedia C-1400XL	As good as it gets. The best quality digital camera you'll find under \$2,000.	1.4 million pixel CCD, 1,280 x 1,024 max resolution, SmartMedia removable storage, 1.8in TFT color LCD panel, built-in flash, SLR; Price: \$1,999; Supplier: R. Gunz (02) 9935 6600; Quality Award, April 1999, p75.
• 56K MODEM	Banksia Wave SP56 V.90	A very fast and well featured modem for the serious surfer.	56K V.90 modem, Rockwell chipset, Quicklink Message Centre III, Internet and shareware apps; Price: \$299; Supplier: Banksia (02) 9424 2070; Speed Award winner, December 1998, p66.

**MOTHERBOARD: SuperMicro P6SBA**

If you are on the look out for a solid foundation upon which to build a top performance PC, then look no further than the SuperMicro P6SBA. In a competitive Labs the P6SBA managed to blitz the competition and come out on top in the rigorous PC @uthority Benchmarks.

Excellent design and a thorough manual add to its attractiveness.

**PRICE** \$228

**SUPPLIER** BCN Technology (02) 9417 3688

**ISSUE** Speed Award, March 1999, p78

**DIGITAL CAMERA: Olympus C840L**

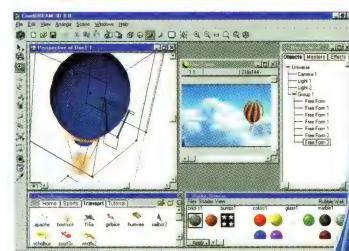
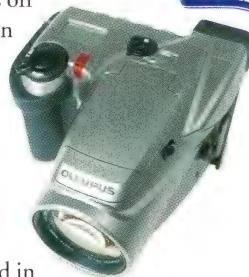
Olympus knocks our socks off again with its latest addition to its Camedia range. Not only did the C-1400XL prove to be extremely easy to use, but its comprehensive set of advanced features and excellent picture quality earned it the Quality Award in our latest digital camera roundup.

Modelled on a bridge camera body, the C-1400XL leads the field with an SLR design. Well worth its asking price.

**PRICE** \$1,999

**SUPPLIER** Gunz (02) 9935 6600

**ISSUE** Quality Award, April 1999, p75

**PROFESSIONAL GRAPHICS:****CorelDraw 8**

Improving on its popular version 7 with a new streamlined interface, additional functionality and a definite emphasis on professional productivity, CorelDraw 8 makes the grade as a full professional graphics package.

**PRICE** \$899

**SUPPLIER** Corel 1800 658 850

**ISSUE** Recommended Award, April 1998, p98

**2D/3D GRAPHICS CARD: Diamond Viper V550**

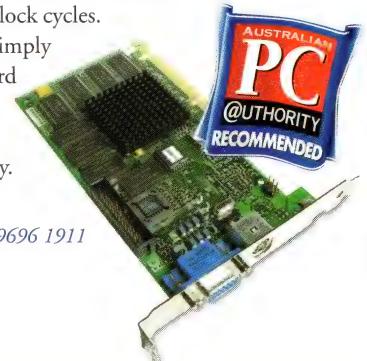
The Diamond Viper V550, utilising the nVidia Riva TNT chipset, offers outstanding performance in the flat realms of 2D desktops, and the deeper 3D worlds of modern gaming and graphics. The TNT stands for TwiN Texel, which basically means that texture and lighting paths can be drawn in one cycle, as opposed to the normal two clock cycles.

In simpler terms, the V550 simply outperformed every other card in just about every 3D test, with incredible frame rates and even DVD compatibility.

**PRICE** \$449

**SUPPLIER** Chips and Bits (03) 9696 1911

**ISSUE** Recommended Award, November 1998, p82



SOFTWARE	PRODUCT	DESCRIPTION	SYSTEM REQUIREMENTS
• 3D GRAPHICS	LightWave 5.5	Fully featured and the best value professional 3D package around.	Windows 95 or above, 32Mb RAM, 90Mb hard disk space; Price: \$2,695; Supplier: New Magic (03) 9532 9566; Recommended Award, December/January 1998, p78.
• BITMAP GRAPHICS	PhotoShop 5	A whole host of new features firmly cement Photoshop's lead in the production environment.	Pentium/90 or above, 32Mb of RAM, 60Mb of hard disk space; Windows 95 or NT4; Price: \$1,495; Supplier: Adobe 1800 065 628; Recommended Award, October 1998, p66.
• VECTOR GRAPHICS	CorelDraw 8	An improvement on earlier versions, especially in the realm hard of professional productivity.	Windows 95 or above, 32Mb RAM, 90Mb of hard disk space; Price: \$899; Supplier: Corel 1800 658 850; Recommended Award, April 1998, p98.
• WEB AUTHORING	FrontPage 98	Lots of new features and improvements means FrontPage 1998 is still the most easy-to-use.	Windows 95 or above, 32Mb RAM, 67Mb of hard disk space, Price: \$179; Supplier: Microsoft (02) 9870 2100; Recommended Award, February 1998, p110.
• WEB ANIMATION	MacroMedia Flash 3	With major new transparency and morphing effects as well as improved HTML integration, Flash 3 sets a new standard for the production of dynamic Web sites.	Pentium/90, 24Mb of RAM, 20Mb of hard disk space, Windows 95/98 or NT 4; Price: \$569; upgrade \$199; Supplier: Firmware 1800 060 357; Recommended Award, January 1999, p96.
• JAVA DEVELOPMENT	Borland Jbuilder Professional 1.0	Forethought and planning have made Jbuilder the only real choice for Java developers at all levels.	Pentium/90 or above, Windows 95 or NT4.0, 32Mb RAM, 67Mb of hard disk space. Price: \$1,059; Supplier: Borland International 1800 632 266; Recommended Award, March 1998 issue, p108.
• REMOTE ACCESS	pcAnywhere	Top quality and feature packed, pcAnywhere is perfect for the user on the move.	Windows 95 or NT3.51 and above, 8Mb RAM, 16Mb of hard disk space; Price: \$239; Supplier: Symantec (02) 9850 1000; Recommended Award, March 1998 p104.
• ATLAS	Encarta 98 World Atlas	Slick presentation and a wealth of information in an entertaining and accessible format make Encarta Atlas the best in its class.	Pentium/50 or above, Windows 95 or NT 4.0 or above, 8Mb RAM, 29Mb of hard disk space; Price: \$79; Supplier: Microsoft (02) 9870 2100; Recommended Award, April 1998, p112.
• MIDI SEQUENCER	Cakewalk Pro Audio 7.01	A powerful audio and MIDI package with real-time DirectX audio effects, staff notation and multiple sound card support. The interface is easy to learn and capable of fulfilling most recording needs.	Pentium/120, 64Mb of RAM, 17Mb of disk space, Windows 95/98 or NT 4; Price: \$799; Deluxe: \$899; Supplier: Roland Australia (02) 9982 8266; Recommended Award, December 1998, p106.
• GAME	Half-Life	Simply the most fantastic 3D perspective game on the market. Half-Life's intense game play is complemented by a thoughtful and engaging story line.	Pentium II/233, 24Mb of RAM, 2-speed CD-ROM drive, 400Mb of hard disk space, sound card; Price: \$89.95; Supplier: Dataflow (02) 9417 9710; reviewed February 1999, p210.

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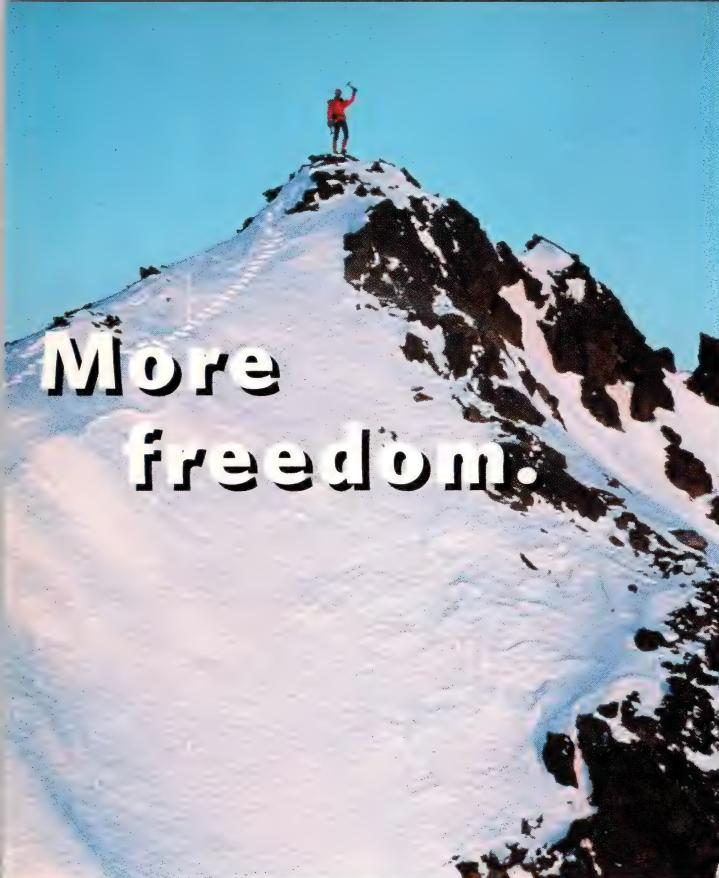
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16-bit Stereo, internal speakers, headphones, ext. volume  
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16-bit Stereo, internal speakers, headphones, ext. volume  
2 Type II or 1 Type III PCMCIA slots  
9-cell Lithium Ion battery & AC Adapter  
Casual Case  
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2.5MB 256-bit SGRAM Graphics Accelerator  
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Modular 1.44MB Floppy Disk Drive  
Modular 8xMin / 20xMax CD ROM  
16-bit Stereo, internal speakers, headphones, ext. volume  
56k Data/Fax Modem  
2 Type II or 1 Type III PCMCIA slots  
9-cell Lithium Ion battery & AC Adapter  
Casual Case  
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56k Data/Fax Modem  
2 Type II or 1 Type III PCMCIA slots  
12-cell Lithium Ion battery & AC Adapter  
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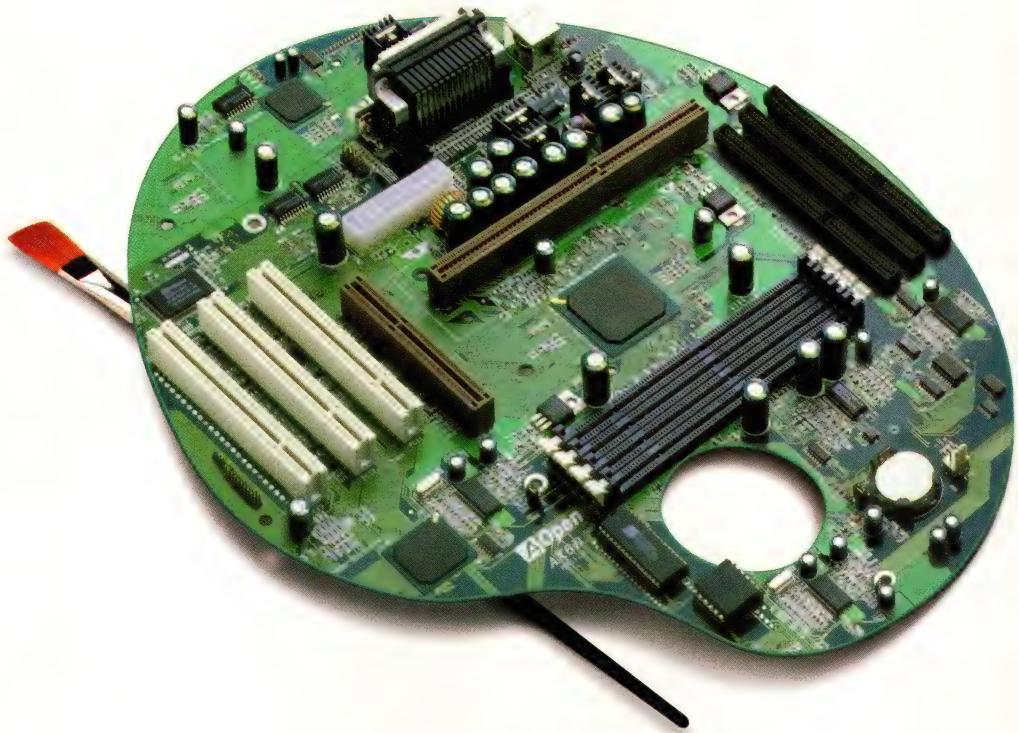
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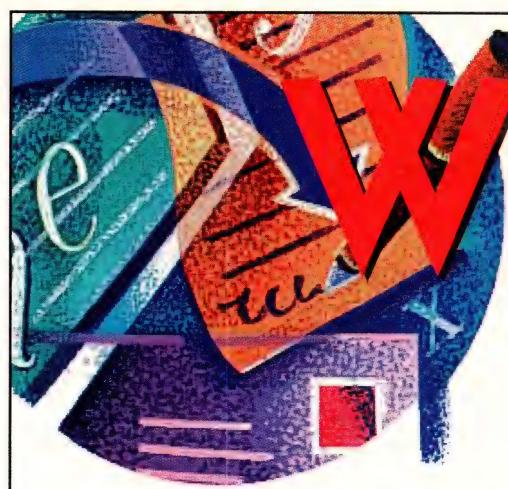
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Serv/6090



### A better Expert

With reference to the letter from P. Smith regarding this dissatisfaction with Home Design 3D by Expert Software, I have nothing but praise for the support I received from Expert Software. After installing Home Design 3D on my Win 95 machine, the program would lock up after a few minutes, requiring 'Control-Alt-Delete' to close the program down.

I contacted Data Flow, the Australian distributor, but received no assistance. I then contacted Expert's technical support via their North American Web site. Expert

Software contacted me within 24 hours requesting additional information about my machine, in particular detailed info regarding my video card, drivers etc. Within a couple of days they advised that the problem was due to my machine having Direct X5 installed whereas Home Design 3D was designed to work with Direct X3. They offered me the choice of an alternative Expert Software package or I could wait for an updated version of Home Design 3D to become available. I opted for the updated Home Design 3D. Within a week a courier delivered a parcel to my door. It had been sent express delivery from North America. Examination of the packaging revealed that the express delivery cost Expert Software more

than the retail price of Home Design 3D. Inside the package was Home Design Premier including a complementary generic CAD program as well as a landscaping program. All these programs worked on my machine.

I believe that if P. Smith had included his full postal address in his emails to Expert Software, (as I did) then he too would have received a copy of Home Design Premier.

G. Harris

### STAR LETTER

#### Y2K Reality

While I appreciate the concern of some people regarding the issue of the so-called 'Millennium Bug' and its possible effects, I feel you missed an opportunity to help dispel some of the misinformation currently being circulated. Mr. Hampton's expressions of concern, in my opinion, exemplify the typical lack of understanding of the problem. Just because a device has a 'chip' in it does not automatically mean it will not function on January 1, 2000. It is the software, not the chip, which is at the root of the problem. Even then, only software that uses date information will be affected. And only if it doesn't cater for dates beyond December 31, 1999 or accommodate four digit years.

In one example, Mr. Hampton asks whether or not your car will start. It probably will. Has he taken time to ring his manufacturer? I rang both Ford and Holden

and asked for their advice. I was informed that unless I had a model built prior to 1997 and it had a Trip computer I would have no trouble starting and running the car. You see the 'chip' that controls my car's electronic ignition, fuel injection, emissions equipment and automatic gearbox doesn't use date related information and so will not be affected. Even cars built prior to 1997 with Trip Computers will still run. The functionality of the Trip Computer may be impaired. To remedy this, return the car to a dealer for an upgrade. The 'chip' doesn't affect the radio, steering or brakes either.

The example of traffic lights not working also needed clarification. I rang my local transport authority and was told that the controlling software has been upgraded and tested for Year 2000 compliance. This software is sourced from a supplier in N.S.W. and it is

reasonable to assume that most states and local authorities have done the same.

The Fire Brigade fire engine will not be affected as these trucks are in a similar situation to motor cars.

Telecommunications may be affected, but Telstra informs me that it has taken steps to ensure that the telephone network is functioning in 2000 and beyond. My local electric power authority informs me that it will have the grid running in 2000. Same with the water and gas authorities and the Ambulance service.

I was concerned about the possible loss of services, but a few well placed telephone calls to the appropriate people has greatly eased my mind. I found, without exception, all were only too keen to discuss the matter, advise me of the steps they have taken, and allay my fears.

I. Hollis

### WIN

If you have a good story, an amusing anecdote or a tale of woe we want to hear from you! You could win a copy of Microsoft Windows 98 (upgrade)

and Microsoft Plus! 98

worth  
\$238!



Please Note: All contributions to PC @uthority will be considered for publication on these pages. Please keep submissions under 200 words.

### Coasting along with AOL

Your star letter in issue 16 caught my attention. I am yet to read or hear anything good about the AOL '100 hours free' CD that appears on every computer-related magazine you pick up these days. Well I am here to say thank you to AOL! I have had enough of all its knockers and would like to thank them for their forethought in using the colors of blue and yellow on their CD's. Having recently purchased a computer, I have



## Getting in Touch

## ✉ WRITE

Write On, PC @uthority Editorial, Suite 1, Unit 1a,  
35 Doody Street, Alexandria, NSW 2015

## ✉ FAX Write On, PC @uthority on (02) 9317 3559

## ✉ EMAIL pc@uthority.ajb.com.au

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Please limit Write On submissions to 200 words.

To get in touch with any of our Real World Computing contributors, please use the email address listed above.

become a very proud NERD, and thanks to AOL I can now incorporate my desire for home decorating with my new found 'Nerdness'.

After everything that I have read and heard, I would never put an AOL CD in my computer, BUT...they do make terrific coasters! I have found by gluing a layer of blue or yellow felt to the uncolored side of the CD they make quite a novelty talking point when visitors enjoy a drink. As I have decorated my unit in blues and yellows they fit in perfectly with the decor and as well as enjoying the latest in computer news in PC @uthority I now have a 'large' collection of coasters. Once again thank you AOL and of course PC @uthority.

Jo Sterritt

## David Hollingworth replies:

Well, I'm glad that we can offer a wide variety of services, but I don't think we'll be putting Better Homes and Gardens out of business any time soon. Any interior decorating tips we may inadvertently give are entirely coincidental.

## Sharing old and new

Two recent articles by Valens Quinn on refurbished hardware raises the question of connectivity of the older 486 systems to newer Pentium

systems.

login with Valens Quinn

SECOND TIME AROUND



We have a situation that is not

Who needs a new PC when you can buy a refurbished one?

unusual in this computer age of having older machines at home that, while perfectly serviceable, may just as well have an infectious disease as far as being used by the family is concerned. The reason is not so much that the computers are old or slow, for as you point out that when running the appropriate software, performance is acceptable.

The resistance stems from the simple fact that the scanner, colour printer and other peripherals are attached to the newer Pentium machine and everyone wants to work in colour. The

simple solution to our problem would be to connect the machines together, say in a simple peer to peer network, either using both the Windows for Workgroups and Windows 95 software directly, or alternatively at a low cost by some other method. I have the suspicion that there are several compatibility issues between Windows for Workgroups 3.11 and Windows 95 (in both its FAT systems guises). If this solution is possible, I for one would appreciate an article on how to set it up as this would achieve the twin goals of extending the life of 486 machines as well as improving the level of



family harmony through the ability to share scarce resources.

J. Broadway

## More grit, less mill

I have been enjoying your magazine from the first issue that I bought. However, I am still surprised by your magazine (and others), regarding how

much you emphasize printing pages and pages on new PCs and their specifications. Of course PCs and most other electrical devices get faster, cheaper, and can do more.

A person that buys your magazine will most likely own a PC already. As a PC magazine subscriber, I am not that interested in new PCs, but on how I can use a PC. What I do with my PC, I can do with 120MHz, 400MHz or most other ones. Just have a look around your own office. How often do you change or upgrade your PCs?

All I am saying is that instead of telling us there is another Violin, give us some music to play with!

S. Shabestary

## MP3 positive

For those of you who have been watching current affairs programs recently, you will have noticed that there have been a couple of episodes in which the main story has been a large company, such as Sony, complaining about the

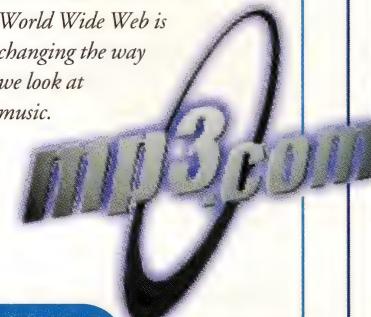
controversial MP3 audio format. Their problem is loss of profits every year due to an alleged decline in CD sales. Companies such as Sony, as I'm sure you know, specialise in high-quality electronic equipment, as well as having a firm grip on the retail music industry. As a result of this, they pull down millions upon millions of dollars in consumer sales annually. In my opinion, the consumer has been the victim of companies such as Sony, who set their CD RRP at around \$30.

MP3 is one of the few ways in which we consumers can get a little of our own back after years of being ripped off, and for such massive companies to complain about losing a pretty penny out of their merry millions is just plain greedy. It's high time some of today's monopolies got their paws singed.

M. Powell

## David Hollingworth replies:

You're not alone in believing MP3 to be the future of music distribution. Artists such as Tom Petty, David Bowie and Chuck D have all come out on the side of this new model of music distribution. Read our feature on page 142 for more details on how the World Wide Web is changing the way we look at music.



## Competition Winners

PC @uthority extends a hearty congratulations to this month's winners. Our competitions have had tremendous responses, and we'll be sure to keep the prizes coming in the months to come.

## March XFIG numerical crossword

**Prize:** Banksia Wave 56SP modem

**Winner:** R. Hayes, Newcomb, VIC

## AOL March 3Com 56k modem

**Winners:** K. Underwood, Balaklava, SA; R. Roos, Crestmead, QLD; S. Grant, Manly, NSW; G. Romcke, Revesby, NSW; B. Wingrove, Summer Hill, NSW

Please contact **Regina Edista** on (02) 9317 4266 at PC @uthority to claim your prize.

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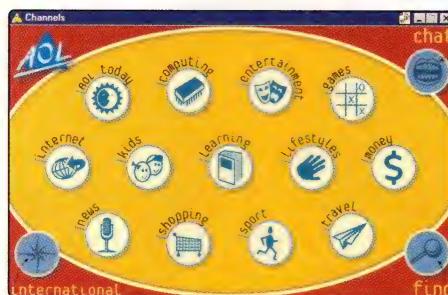
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### It's Easy

It's easy to get online with AOL. All you need is a 486 PC or higher, 16MB of RAM, 25MB of HD a VGA monitor (256 colour support recommended), a mouse, a modem, a copy of Windows 95/98 and a phone line. Just insert the cover disk and follow the simple installation instructions to be online in minutes. It's never been so easy to discover Australia and the world with AOL. If you do need any FREE technical assistance we are here 24 hours a day, 7 days a week. Call Member Services on 1300 654 633.

### Your AOL

So what exactly is up for grabs? Well, for starters your AOL account gives you five different screen names, or email addresses, which you can create. This means that you can have one for business and one for pleasure, or one for each member of your family. Your



screen name then becomes your email address by adding @aol.com to the end. Email can be sent to anyone online. If you're emailing another AOL member you can use the added features of hotlinks to personalise your email by changing the size, colour and style of your text - you can even add your photo.

### Neat Tools with AOL

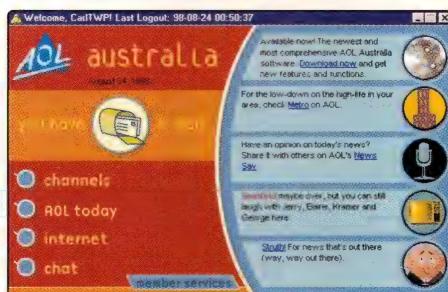
And don't forget about the other neat AOL tools. Create a "Buddy List" which shows you which of your AOL friends are currently online. You can even pop an Instant Message onto a friend's screen for an instant two-way conversation - a bit like an interactive post-it-note! Plus your own online address book helps to keep track of all your friend's and family. You are given a generous 2Mb of Web space per screen name - there are even online tools, which make building your own home page simple!

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AOLFPS001

# IT'S ALL GOT TO GO!

WHEN ON YOU'RE ON BUDGET, YOU NEED TO WATCH MORE THAN YOUR WALLET. THIS MONTH WE'VE TRIED TO GET THE BEST PERFORMANCE AND QUALITY FOR THE LEAST OF YOUR CASH POSSIBLE.

There are few people who don't want to break into the computing revolution, but there are few people with the cash to do it in a truly grand manner. Computer manufacturers and suppliers have come to see the budget minded user as an important part of the buying community, and prices are plummeting almost daily in an effort to offer the most bang for the least bucks.

But what makes a good budget machine? Actually, the same things that make a good high-end PC or workstation are what makes a good budget buy, but on a slightly smaller scale. You want a good processor, a rounded range of peripherals, and overall you want the same level of reliability.

A cheap processor no longer means that you'll be sacrificing power for less expenditure. The latest incarnation of the Celeron is quite capable of performing in the same arena as Pentium II processors of similar speeds, sometimes even faster. There are even alternatives to Intel, in the shape of AMD and Cyrix, though you will begin to experience some drop in performance, though they will both be quite adequate for most computing tasks.

Equipping a PC with a broad range of peripherals is quite a challenge when you're working with a limited

budget. It is often easier to target a machine at a specific purpose; supply a modem and connectivity kit, and you've got a good e-machine, or throw in a decent graphics card and some extra RAM, and a good gaming experience comes within your reach. The trick is in knowing what you want your PC for. The other option is to include everything, but cut back on the quality of the peripherals you include - no name graphics cards, low capacity hard drives, and klunky keyboards are often good giveaways to this mentality, and it is a mindset best avoided. You can always upgrade your e-machine or games box to match your expanded computing needs at a later date.

Lastly, you want a machine that works. Just because you're spending less does not mean that you are entitled to less reliability. Making sure that your new PC is supported by a good warranty, with parts and service is important, as is assuring that your machine is well put together. Poorly fastened components, missing wiring and parts that just don't work seem sadly common amongst manufacturers of budget PCs.

**Editor:** Valens Quinn

**Contributors:** David Hollingworth, Tremayne Sargeant, Matt Cockett, Simon Tsang

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## SPECIFICATIONS &amp; FEATURES

Manufacturer and model name	Also Technology Plus	Value Speed	Computers Direct	Budget Buster	Landmark Diamond Super 7	PC View Omega 366	Pioneer Value System
• Price (incl. tax)	\$1,499	\$1,499	\$1,500	\$1,499	\$1,499	\$1,499	\$1,499
• Credit card surcharge	3%	3%	3%	3%	3%	3%	2%
• Shipping charges	Varies nationwide	Varies nationwide	Varies nationwide	Varies nationwide	Varies nationwide	Varies nationwide	Varies nationwide
• Supplier	Alsotech	Computers Direct Australia	Landmark I.T. Resources	PC View	Pioneer Computers Australia	Pioneer Computers Australia	Pioneer Computers Australia
• Phone	02 9519 4600	02 9967 3488	02 9585 9988	02 9966 0066	02 9690 2888	www.pioneercomputers.com.au	www.pioneercomputers.com.au
• Internet	www.alsotech.com.au	www.computersdirect.com.au	N/A	www.pcview.com.au	www.pcview.com.au	www.pioneercomputers.com.au	www.pioneercomputers.com.au
• Basic warranty	2 yr Parts 5 yr Labour	3yr RTB, 1st yr on-site	2yr parts 5yr labour	2yr RTB	2yr RTB	2yr parts 5 yr labour	2yr parts 5 yr labour
<b>Case</b>							
• Case type	Midi tower	Midi tower	Mini tower	Midi tower	Midi tower	Midi tower	Midi tower
• height x width x depth (mm)	405 x 212 x 425	435 x 185 x 422	333 x 180 x 410	425 x 183 x 475	425 x 185 x 422	435 x 185 x 422	435 x 185 x 422
• PSU rating (Watts)	250	250	250	250	250	250	250
• Mains passthrough plug	N	N	Y	Y	N	N	N
<b>Motherboard</b>							
• Make and model	ATC-6220	Gigabyte GA-6BXc	Gigabyte GA-5AD	AOpen AX63	SuperMicro P6SBA	Intel Celeron/333	Intel Celeron/333
• Processor type	Intel Celeron/400	Intel Celeron/333	AMD K6-2/300	Intel Celeron/366	Slot 1	Slot 1	Slot 1
• Processor socket	Slot 1	Slot 1	Super Socket 7	Via Apollo Pro Plus	400MHz	600MHz	600MHz
• Chipset	Intel 440BX	Intel 440BX	Ali M1542	400MHz	66MHz	66MHz	66MHz
• Maximum processor supported	450MHz	650MHz	400MHz	450MHz	66MHz	66MHz	66MHz
• Bus speed	66MHz	66MHz	100MHz	100MHz	66MHz	66MHz	66MHz
<b>Buses</b>							
• AGP free/total	0/1	0/1	0/1	0/1	0/1	0/1	0/1
• PCI free/total	3/4	4/4	3/3	4/5	4/4	4/4	4/4
• 16-bit ISA free/total	2/3	2/3	1/2	1/2	2/3	2/3	2/3
• Shared slots	1	1	1	1	1	1	1
<b>Memory</b>							
• RAM size and type	64Mb	32Mb	64Mb	64Mb	32Mb	384Mb	384Mb
• Maximum RAM	384Mb	384Mb	384Mb	768Mb	0/0	0/0	0/0
• SIMM sockets free/total	0/0	0/0	0/0	0/0	2/3	2/3	2/3
• DIMM sockets free/total	2/3	2/3	2/3	2/3	128Mb	128Mb	128Mb
• Secondary cache size	128Kb	128Kb	512Kb	128Kb	333MHz	333MHz	333MHz
• Secondary cache to CPU bus speed	400MHz	333MHz	100MHz	366MHz	AMIBIOS Rev4	AMIBIOS Rev4	AMIBIOS Rev4
• BIOS type and version	Award 4.51PG	Award 4.51PG	Award 4.51PG	Award 4.51PG			
<b>Hard disk</b>							
• Make and model	Quantum Fireball EX	Quantum Fireball EX	Quantum Fireball EX	Seagate Medalist	Quantum Fireball EX	3.2Gb	3.2Gb
• Size (unformatted)	3.2Gb	3.2Gb	3.2Gb	6.4Gb	Ultra ATA	Ultra ATA	Ultra ATA
• Type	Ultra ATA	Ultra ATA	Ultra ATA	Motherboard EIDE	Motherboard EIDE	Motherboard EIDE	Motherboard EIDE
• Controller and bus	Motherboard EIDE	Motherboard EIDE	Motherboard EIDE				
<b>Free drive bays</b>							
• Front panel 5.25in	2	2	1	3	2	2	2
• Internal 5.25in	0	0	0	0	0	0	0
• Front panel 3.5in	1	1	1	1	1	1	1
• Internal 3.5in	0	0	0	0	0	0	0
<b>Interfaces</b>							
• Ports (see key below)	2S 1P 1G 2USB	2S 1P 1G 2USB	2S 1P 1G	2S 1P 1G	2S 1P 1G 2USB	Logitech 2-btn PS/2	Logitech 2-btn PS/2
• Mouse type	Logitech 2-btn PS/2	Microsoft 2-btn 1-wheel PS/2	Logitech 3-btn	AOpen 2-btn PS/2	Mitsubishi Diamond Touch PS/2	Mitsubishi Diamond Touch PS/2	Mitsubishi Diamond Touch PS/2
• Keyboard type	Mitsubishi Diamond Touch PS/2	Honeywell Spacemate PS/2	Perfect Touch Feeling AT	Acer AccuFeel PS/2			
<b>Graphics</b>							
• Make and model	Diamond Viper V550	Video-71AGP3D	Gigabyte GA610	Diamond Speedstar A50	Diamond Viper V550	nVidia Riva TNT	nVidia Riva TNT
• Chipset	nVidia Riva TNT	S3 Trio3D	Intel 740	SIS 6236	128-bit	128-bit	128-bit
• Chip bus size	128-bit	128-bit	64-bit	64-bit	AGP	AGP	AGP
• Bus	AGP	AGP	AGP	AGP	8Mb	8Mb	8Mb
• Memory installed	16Mb	4Mb	8Mb	4Mb	8Mb	8Mb	8Mb
• Max upgradeable memory	16Mb	4Mb	8Mb	4Mb	1,920 x 1,200 x 256 @ 85Hz	1,920 x 1,200 x 256 @ 85Hz	1,920 x 1,200 x 256 @ 85Hz
• Max resolution x colour @ refresh rate	1,920 x 1,200 x 16.7M @ 85Hz	1,280 x 1,024 x 256 @ 60Hz	1,600 x 1,200 x 64K @ 75Hz	1,600 x 1,200 x 256 @ 60Hz	nVidia Riva TNT		
• 3D acceleration	nVidia Riva TNT	S3 Trio 3D	Intel 740	SIS 6236			
<b>Monitor</b>							
• Make and model	Mitsubishi Diamond View 1554e	Samsung Samtron 50E	Mitsubishi Diamond View 1554e	Panasonic E50I	Daewoo 518x		
• Dot pitch (mm)	0.28	0.28	0.28	0.28	0.28		
• Nominal tube diagonal (in)	15	15	15	15	15		
• Measured screen diagonal (in)	13.7	13.9	13.7	13.8	14		
• Max non-interlaced resolution (W x H x Hz)	1,280 x 1,024 x 60Hz	1,024 x 768 x 60Hz	1,280 x 1,024 x 60Hz	1,024 x 768 x 60Hz	1,024 x 768 x 60Hz		
<b>Software supplied</b>							
• Operating system	Windows 98	Windows 98	Windows 98	Windows 98	Windows 98		
• Main titles		You Don't Know Jack vol2			Lotus SmartSuite 97, AOL connection software		
<b>Peripherals</b>							
• CD-ROM/DVD drive and speed	Mitsubishi Diamond Data 40x	Hitachi CDR-8435	AOpen MTRP 36x	AOpen MTRP 40x	AOpen MTRP 32x		
• Sound card	Yamaha DS-XG	AOpen AW35	Creative Labs Vibra 16	AOpen AW37	Creative Labs Vibra 16		
• Speakers	DKL SP-691	DKL SP-691	Echo OD-971	MS 203	DKL SP-691		
• Modem and speed	Internal 56K Rockwell based	N/A	N/A	Dynalink Internal 56K	N/A		
• Backup device	N/A	N/A	N/A	N/A	N/A		
• Network card	N/A	N/A	N/A	N/A	N/A		
• Other	N/A	N/A	N/A	N/A	N/A		

Key S = fast 16550 UART serial port; P = enhanced parallel port (ECP or EPP); G = game port; USB = Universal Serial Bus; RTB = Return to base

Spear Technology QDI DVD 333	TPG Celeron Office	Ultimate P5400c
\$1,499 N/A Varies nationwide Spear Technology 02 9904 8199 www.qdi.com.au 2yr parts and labour	\$1,499 2% Varies nationwide Total Peripherals Group 02 9850 0800 www.tpg.com.au 3yr on-site metro only	\$1,499 3% Varies nationwide Ultimate Computing Technology 03 9584 2896 www.uct.com.au 2yr parts 5yr labour
Midi tower 425 x 180 x 444 230 Y	Desktop 163 x 432 x 430 235 Y	Midi tower 423 x 182 x 474 200 Y
QDI21410X6 Intel Celeron/333 Slot 1 Intel 440ZX 333MHz 66MHz	TPG P6L40-A4E Intel Celeron/333 Slot 1 Intel 440LX 333MHz 66MHz	SuperMicro P6SBA Intel Celeron/400 Slot 1 Intel 440BX 600MHz 66MHz
0/0 2/2 1/1 1	0/1 4/4 2/3 1	0/1 4/4 2/3 1
32Mb 512Mb 0/0 1/2 128Kb 333MHz Award 4.51PG	32Mb 384Mb 0/0 2/3 128Kb 400MHz Award 4.51PG	32Mb 384Mb 0/0 2/3 128Kb 400MHz AMIBIOS Rev4
Fujitsu 8.3Gb Ultra ATA Motherboard EIDE	Seagate Medalist 4.3Gb Ultra ATA Motherboard EIDE	Quantum Fireball EL 6.4Gb Ultra ATA Motherboard EIDE
1 0 2 0	1 0 0 1	3 0 1 0
1S 1P 1G 2USB Perfect 3-btn Serial ES-378 PS/2	2S 1P 1G 2USB Microsoft 2-btn PS/2 Mitsubishi Diamond Touch PS/2	2S 1P 1G 2USB Artec 2-btn PS/2 Acer Accufeel PS/2
ATI Rage IIc ATI Rage IIc 64-bit Integrated AGP 4Mb 4Mb 1,600 x 1,200 x 256 @ 60Hz ATI Rage IIc	CardExpert ST3D S3 Trio3D 128-bit AGP 4Mb 4Mb 1,600 x 1,200 x 64K @ 60Hz S3 Trio 3D	ColorMax UA-391 S3 Savage3D 128-bit AGP 8Mb 8Mb 1,600 x 1,200 x 32K @ 60Hz S3 Savage 3D
Logix 1531A 0.28 15 13.6 1,280 x 1,024 x 60Hz	TPG 1569SE 0.28 15 13.8 1,280 x 1,024 x 60Hz	Hyundai Delux Scan 5854 0.28 15 13.7 1,024 x 768 x 60Hz
Windows 98 PC Cillin Anti Virus, QDI Manage Easy	Windows 98	Windows 98
Hitachi DVD 6x Creative Labs Vibra 16	Mitsubishi Diamond Data 36x ESS 1869	AOpen MTRP 36x Asound 3D
CD Sonic AE120E N/A N/A N/A N/A	MS 791 N/A N/A N/A N/A	SP-710 N/A N/A N/A N/A

## PC@UTHORITY BENCHMARKS

**Microsoft Word 97:** Word opens a 20-page document and performs multiple operations on it including embedding graphs and a WordArt object as well as changing margins to force repagination. The test is very CPU, RAM and hard disk intensive.

**Excel 97 Business:** Excel opens a six-sheet workbook. Base data is changed forcing formulae to be recalculated while graphs are created from summary data. All worksheets are shown at various magnifications and graphs are formatted with various patterns and gradient fills. This test is very integer intensive and uses the graphics card's abilities at drawing and refreshing windows.

**Excel 97 Scientific:** From a base of 100 cells, financial, trigonometric, date and statistical data is calculated and recalculated at various base values. Graphs are drawn and textured with various backgrounds and gradient fills. 3D drawing objects are moved, rotated and manipulated. This test is floating point intensive as well as testing general CPU and graphics performance.

**Adobe Photoshop 4:** A large graphic is opened and irregularly rotated and cropped. A hue based selection is separated, colour corrected and remerged into the original layer. CPU and RAM intensive filters are applied to the image which is then converted to RGB, CMYK and Web optimised palettes. The file is then saved in several common graphics file formats. This test is particularly RAM intensive as well as pushing the CPU and hard disk subsystem.

**Microsoft Access 97:** A 400,000 row database is opened and complex Join and CrossTab queries are run to summarise the data. All three tables are opened and scrolled through. This benchmark tests general integer CPU and RAM performance.

## SHARK FISHING

It is PC @uthority Labs policy that all products featured must be made available to the public for the exact specification and price for at least four weeks from the publication date of the magazine.

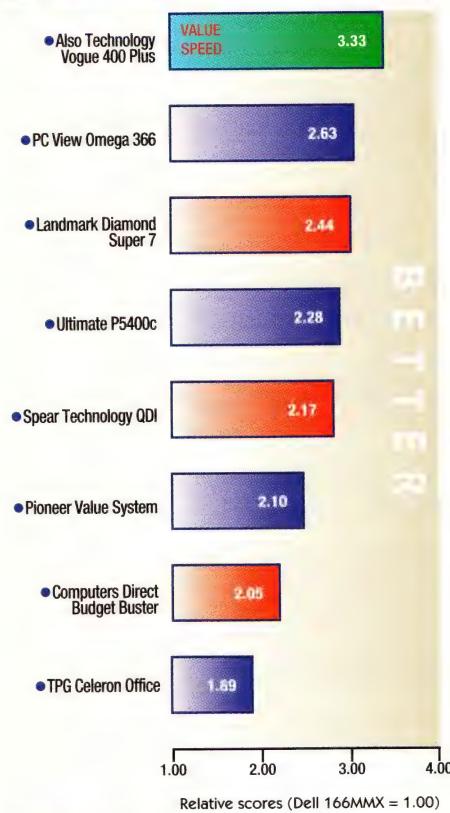
Although we want to ensure that you will be able to buy the exact machine that we review, manufacturers are free to increase the features, such as the hard disk size or add more RAM, or lower the price for the same specification.

The Labs team will perform a series of spot tests each month to ensure the integrity of the manufacturers featured in the previous month and if we detect any infringements, we'll report it here. To make Shark Fishing work we need your help. If you ever experience discrepancies with any of the systems seen in PC @uthority, please contact us at the address listed on page 46. Get a signed quote from the company in question and fax it to us with a full description of your experience. We will follow through and take appropriate action, removing any falsely earned awards or even banning the company from the Labs for several months if necessary.

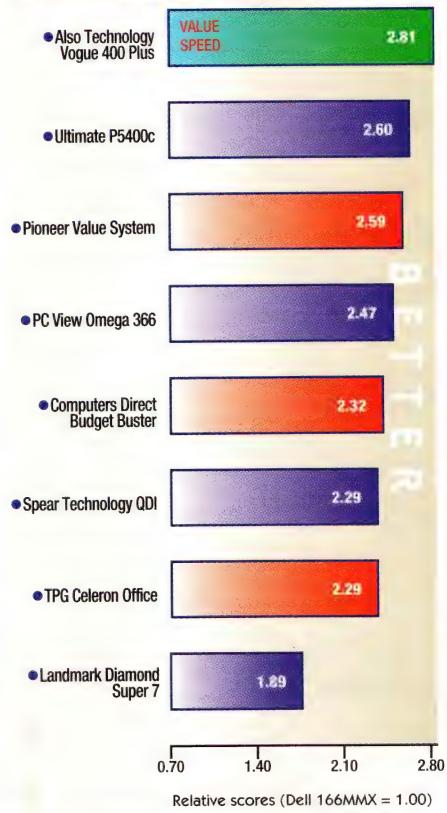


# PERFORMANCE MEASUREMENTS

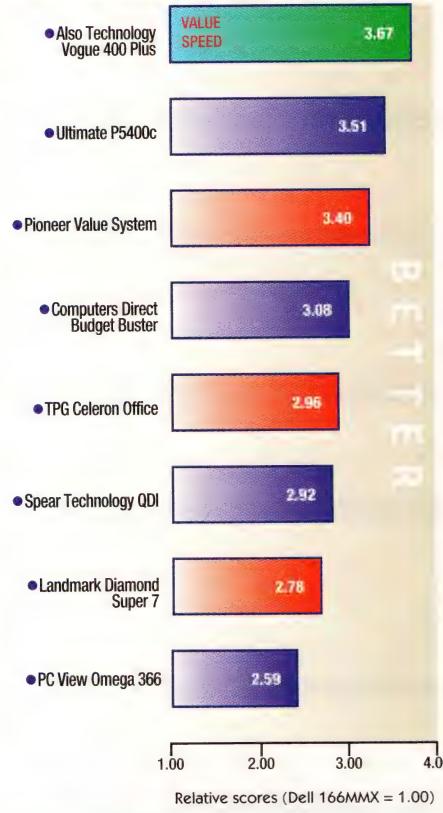
## PHOTOSHOP 4.0



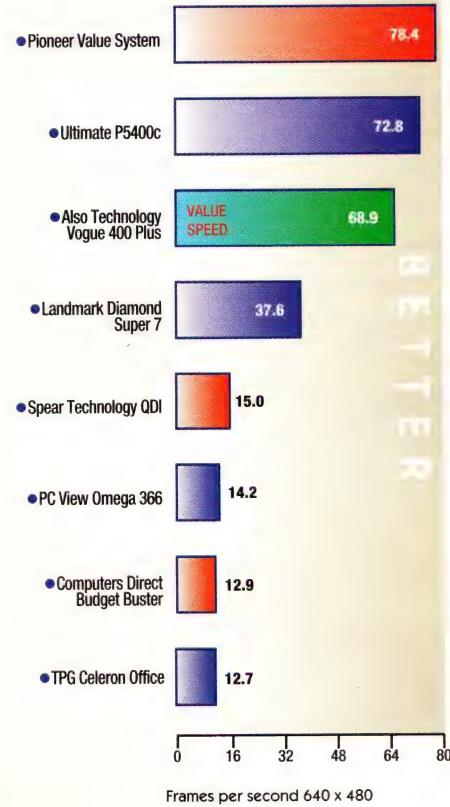
## ACCESS 97



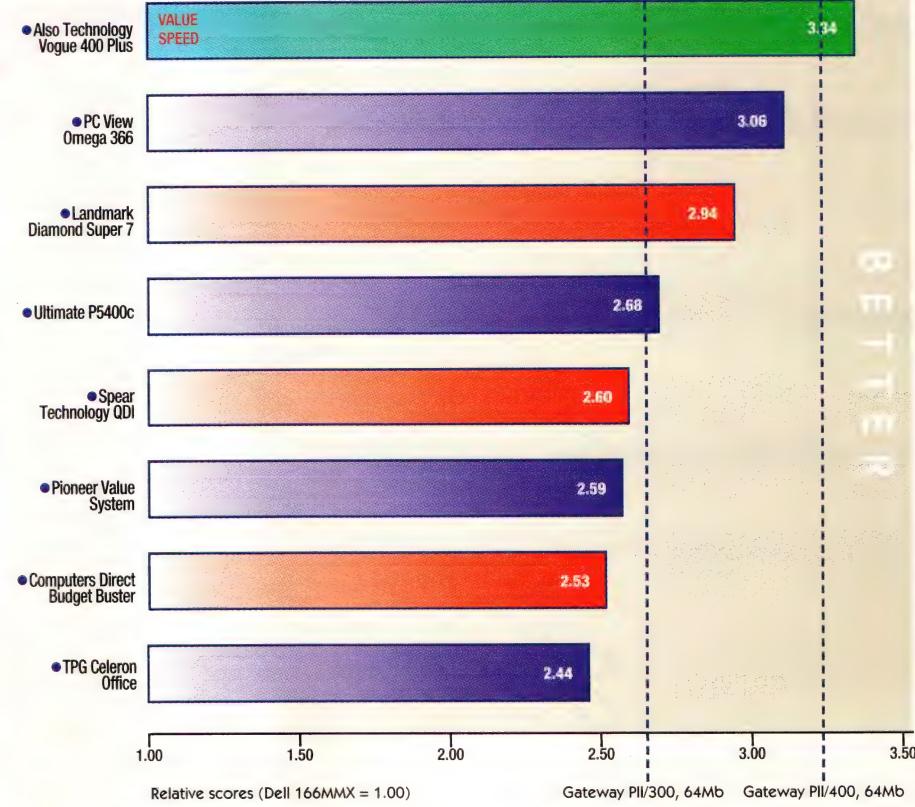
## WORD AND EXCEL



## FORSAKEN DIRECT 3D



## OVERALL SCORE



# RAILROAD TYCOON II



**MISSION PACK OUT NOW**  
**'Railroad Tycoon II: The Second Century'**



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PETT 99003B





## ALSO TECHNOLOGY

### Vogue 400 Plus

**VERDICT** A clear winner of both our Speed and Value awards, with a full selection of quality peripherals and excellent performance.

**PRICE** \$1,499

**SUPPLIER** Also Technology (02) 9519 4600

**W**hen this sub-\$1,500 Labs was first conceived we expected a certain level of performance and a greatly reduced feature set. After all, there is only so much that you can do with \$1,500. For the most part, we got what we expected, but the bar was raised almost impossibly high when we unpacked the Also Technology Vogue 400 Plus.

Slipping the side panel off the Vogue reveals the startling site of a Celeron/400 processor, hiding beneath sideways mounted power supply. 333s and even the odd 366 were expected, but this much horsepower was indeed a pleasant surprise. 64Mb of RAM was another welcome inclusion, and the Vogue's Benchmark scores reflect the power of the latest model Celerons; its score of 3.34 is on a par with higher end of Pentium II expectations. Not bad for a budget processor. The ATC-6220 mainboard is based on the BX chipset, and in its current configuration can support processors up to 450MHz. Build quality is another high point of the Vogue, with all of the cabling tied back to the internal supports of the medium tower case. The only problem with the internal layout is that processor upgrades necessitate the removal of the power supply. Two free 5.25in and one 3.5in bay allow a lot of freedom for further drive expansion.

A generous array of peripherals is also responsible for the Vogue's high score. Pride of place is taken by a 16Mb Diamond Viper V550 graphics card. A crisp Mitsubishi Diamondtron monitor rounds out the graphics array, featuring sharp text and colours without any hint of moiré or fuzziness at the edges. Sound is not neglected either, with a Yamaha DS-XG soundcard feeding into a pair of DKL speakers - the speakers are not the greatest, but certainly adequate for most tasks. Anyone serious about their sound quality, though, should upgrade with the money they save on buying this system. Lastly, a 56K Rockwell based modem is included, and although there is no Internet package included, the proliferation of AOL CDs at the moment means that most users can start surfing right away.

The Also Technology Vogue 400 Plus is an outstandingly featured system for its price. Just a few months ago, a similar system would have cost you up to \$4,000, and even then might not deliver the same amount of performance. Just check out our December Labs (issue 13, p42) to see just how far we've come.

In fact, we liked the Vogue so much that we thought it deserved both awards this month.

PC @UTHORITY

PERFORMANCE	★★★★★
FEATURES	★★★★★
VALUE FOR MONEY	★★★★★
OVERALL	★★★★★



## COMPUTERS DIRECT

### Budget Buster

**VERDICT** An average system on almost every front, let down by a few low quality peripherals.

**PRICE** \$1,499

**SUPPLIER** Computers Direct Australia (02) 9967 3488

In many ways it is unfortunate that Also Technology supplied such a powerful and well featured system. Without it in the Labs, many of the machines would have fared much better, and received far more glowing reviews. As it is, however, it merely points out that supplying a budget machine is more than just a matter of cutting corners.

The ostentatiously named Budget Buster features the same solid midi tower case that adorns the Pioneer system this month, with a very similarly laid out interior. Some of the cabling is tied back, but most of it just hangs limply from its connections; because of the slim form factor of the Gigabyte GA-6BXC motherboard this is not as much of an issue as it might be. On the board sits 32Mb of RAM along with a Celeron/333 processor - the board is rated for processors up to 650MHz, and a further 352Mb of RAM, providing the system with quite an upgrade path. Performance is on the average side, on a par with many other systems in the Labs, though, like the others, more RAM could fix this easily.

Speaking of expansion, the board is quite roomy, with a total of three ISA and four PCI slots, as well as one AGP slot. One 3.5in and two 5.25in bays offer even further peripheral freedom. This space would be well utilised with a Zip drive or other removable storage device, as the popular and well built 3.2Gb Quantum Fireball EX hard drive will fill quickly.

The Budget Buster's current peripheral load out covers all the essentials, but not in any particular style. A Samsung Samtron 50E feeds into a Video-71AGP3D graphics card, using the S3 Trio 3D chipset, along with 4Mb of video RAM. Picture quality is rock steady under most circumstances, though 3D applications tend to push the S3 based card beyond its limits. Sound quality is on the poor side as well, and while the Hitachi CDR-8435 is a versatile inclusion, for some reason it was impossible to play audio CDs. Even so, the Aopen AW35 and DKL speakers are nothing special.

The Computers Direct Budget Buster offers a lot of room for future upgrades and add-ons, but it would take almost a complete overhaul to bring the system's performance on par with the Value and Speed winner this month. But while the Budget Buster does not lend itself to performance tasks, it is certainly capable of fulfilling a mass rollout to a host of corporate desktops, or as an ideal machine for that child who just has to have a computer.

PC @UTHORITY

PERFORMANCE	★★★★★
FEATURES	★★★★★
VALUE FOR MONEY	★★★★★
OVERALL	★★★★★



## LANDMARK *Diamond Super 7*

**VERDICT** Powered by AMD, but offers none of the price advantages this CPU should deliver.

**PRICE:** \$1,500

**SUPPLIER** Landmark I.T. Resources (02) 9585 9988

**A**s the only system in this Labs to actually utilise its 100MHz FSB (Front Side Bus) in tandem with a cheaper-by-the-Megahertz AMD K6-2/300 CPU, the Diamond Super 7 should have enjoyed a price/performance advantage none of the other Slot 1-based PCs could approach. This however, was not the case. Even having the lowest processor clock speed in the comparison didn't seem to make a dent in its price tag. Super7-based PCs (using PGA sockets) are inherently cheaper than their Slot 1 counterparts as the motherboards and CPUs are less costly to produce. Why else would Intel offer new Celerons in PGA versions as well as Slot 1? The cost benefits however, do not seem to be passed on in this case. In fact, the Diamond Super 7 is \$1 more than all the other systems in this review.

The Gigabyte GA-5AA motherboard itself is a curious piece of hardware in the way it's laid out. Using a conventional Baby AT form factor with hybrid dual AT/ATX power inputs, the GA-5AA is almost square in shape with IDE and floppy connectors located on the far end of the board. This forces the ribbon cables to stretch across the entire guts of the PC, obstructing access to the CPU, and not doing much for the presentation of construction either. The assemblers had no choice but to let the cables hang there in the confined space. USB is notably absent from the list of I/O ports and the keyboard plugs into a DIN5 connector rather than the more compact PS/2. Being of a Socket 7 configuration however, means that the GA-5AA supports a wide range of processors including Pentium MMX, Cyrix MII and IDT's WinChip.

The minitower case mirrors the motherboard in its compact dimensions with only one additional drive bay of each size. It also lacks rigidity due to minimum members bracing the depth of the chassis.

Redeeming aspects of the Diamond Super 7 include the presence of 64Mb of system RAM and 8Mb of RAM onboard the Intel 740-based Gigabyte GA610 graphics card. This combination helped the Diamond achieve a surprising overall third place for combined 2D and 3D performance despite the uninspiring powerplant. The Mitsubishi Diamond View monitor is also a nice touch in an otherwise budget piece of hardware. The Diamond Super 7 deviates from the norm and offers an alternative to the Intel-based offerings in this crowd, but lacks a strong argument when it comes to price.

PC @ AUTHORITY	PERFORMANCE	★★	★★★★
	FEATURES	★★	★★★★
	VALUE FOR MONEY	★	★★★★
	OVERALL	★	★★★★

## CYRIX: QUIET ACHIEVER

Low cost PC sales now account for more than 50 per cent of the retail desktop market, and Cyrix is at the forefront of this burgeoning market. Its processors are in many of the top selling sub \$1,000 PCs, while its product development team continues to raise eyebrows at the IT shows. The company also has a strong vision, 'A ubiquitous PC platform for the information age, bringing information to people anytime, anywhere'. And, with the popularity of its latest processors and Internet related products, the vision is rapidly being fulfilled.

Cyrix provides powerful multimedia technology at low costs meaning many smaller companies are able to buy into the vision. Microworkz, a small Seattle based company, announced last April that it will be releasing the Webzster Jr with a Cyrix 300-MHz MII processor, 32MB of memory, a 3.2GB hard drive, a 56Kbps modem, Windows 98, Corel WordPerfect Suite 8 and online connectivity, all for the give-away price of \$US299.

eMachines is also taking a sizeable chunk of the market by offering its 300c etower, with a Cyrix processor for \$US399. These are just two companies that have joined ranks alongside larger companies like iDot, Packard Bell NEC and Compaq, that are all offering sub-\$US600 PCs in a growing effort to tap the still relatively untapped household market.

But apart from low cost PCs, what else have Cyrix been up to? The vision of 'the wired household' is fundamental to Cyrix, which has recently prototyped a device known as the WebPAD. Designed for those who like to use the Internet 'on the fly', the WebPAD is a wafer thin Web browsing tool that uses radio frequency data transmission technology to give freedom of movement much like that of a portable phone. The 8in by 11in, 1.5in thick package works in conjunction with a dedicated base station, set top box or PC, allowing users to partake in home shopping or on-line banking from anywhere around the home or office.

Cyrix will not be manufacturing the WebPAD, but is instead supplying the blueprints to OEMs along with the hugely successful Media GX processor. The company also envisages marketing the product to ISPs as a free incentive to prospective subscribers. The possibilities, claims Cyrix, are endless!

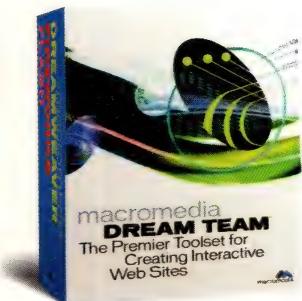
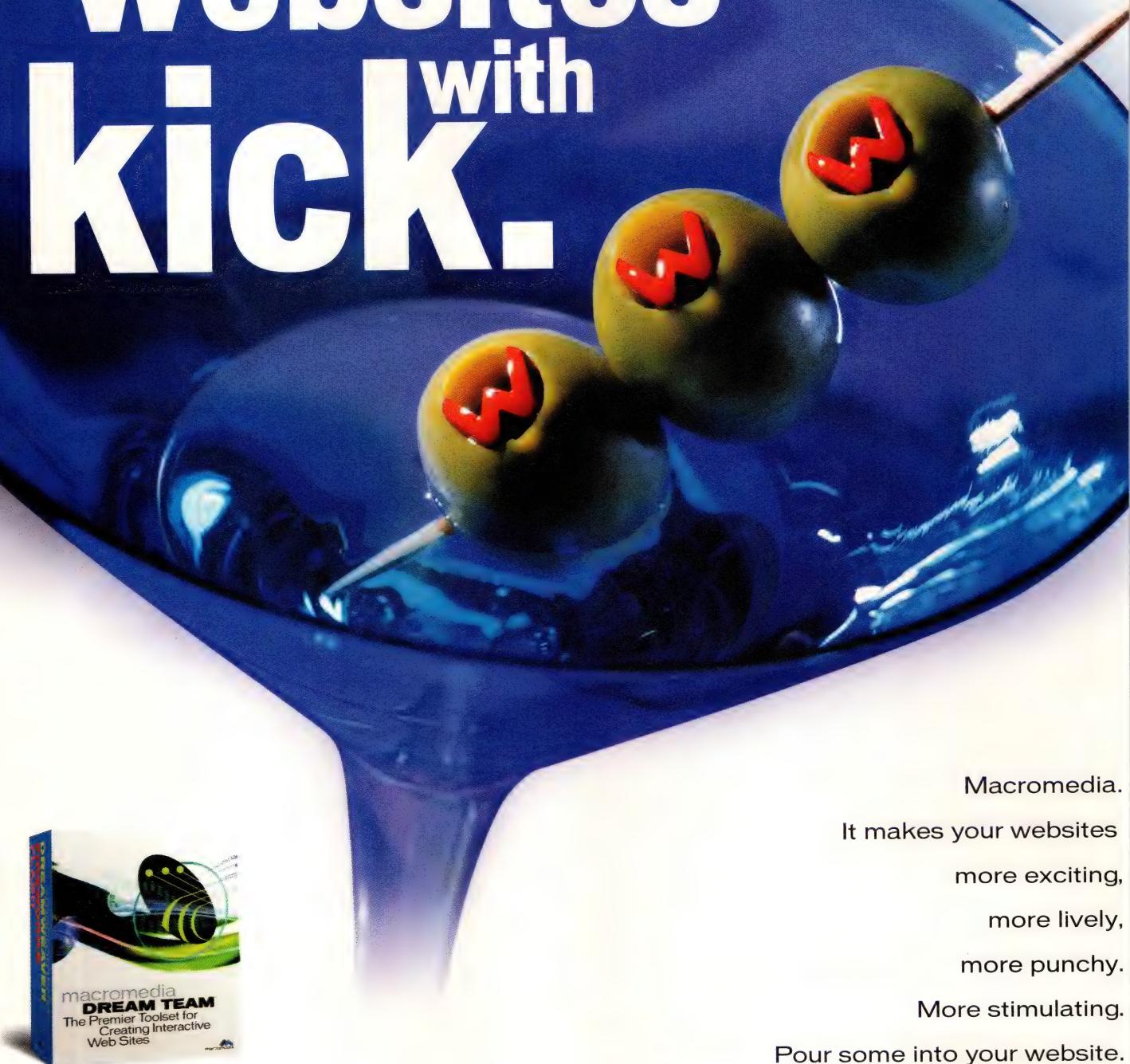
Following a deal announced early March this year Wyse Technology, a thin client specialist, will be manufacturing the 3350SE Windows CE based terminal using the Media GX processor. 'Wyse has recognised a growing desire among our extensive customer base to support multimedia performance for applications such as computer-based training, and the MediaGX processor from National is an ideal solution for delivering this functionality to the thin-client market,' said a Wyse spokesperson.

Wyse is not the only company to be sold on the Cyrix multi-media processor. Compaq is incorporating the MMX enhanced Media GX into its Presario 1230 and 1232 notebook PCs and the MII MMX processor into the new Compaq Presario 2286 Internet PC. Powerspec and Packard Bell NEC also rely on Media GX processors for their desktop PC solutions.

Market analysts believe that both households and businesses will opt for the low cost option, meaning companies like Cyrix and its rival, AMD, are in a winning position. Intel, who is a late arrival in the low-end PC sales arena, is fighting back with its consumer Celeron processor at a reduced price. But the market remains open enough for more than one company to rise to the top. Much of Cyrix's recent success lies in its acknowledgment of the Internet as a driving force behind PC sales. A majority of new and first time buyers see Internet compatibility as a prerequisite, and therefore the new computing model offered by Cyrix technology could mean the World Wide Web will truly become available to anybody, 'anytime, anywhere'.

**Matt Cockett**

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## PC VIEW Omega 366

**VERDICT** A solid choice for the budget conscious user, nudged aside in the honors by the Also Technology machine.

**PRICE** \$1,499

**SUPPLIER** PC View (02) 9966 0066

**I**t could easily be said of that appearance, and how deceiving it can be, is the main theme this month. A number of systems on test look good enough, but really don't cut the mustard when compared to the incredible speed and value of Also Technology's Vogue 400 Plus. Another deceiver, though in a more positive way, is the PC View Omega 366.

Outwardly a simple fascia renders the Omega almost indistinguishable from its counterparts, but popping the midi tower's side panel off reveals an altogether different beast. A Celeron/366 is the heart and soul of the Omega, on a BX based Aopen mainboard with a pleasing 64Mb of RAM. Performance is a somewhat mixed affair, coming second overall in our Benchmark tests, but lagging to a surprising second last in the Word and Excel portions; a very curious performance. The internal layout of the Omega is hampered by the Aopen motherboard's curious design; the floppy drive's ribbon cable stretches across the board, possibly interfering with the processor and graphics card.

Upgraders and tinkerers will find the options presented to them quite pleasing. Three 5.25in bays are at their disposal, and one 3.5in bay. On the board are four free PCI slots, and one ISA slot; a further one each of PCI and ISA, as well as an AGP slot, are already occupied.

A 4Mb Diamond Speedstar graphics card sits in the AGP slot, with a Panasonic monitor at the other end. The monitor offers 13.8in of viewable screen, which boldly displays colours, even if its text is a little blurry. The card is another matter altogether. A 4Mb card is fine for office applications, but will seriously handicap any home user hoping for a bit of graphics punch.

Audio seems to have been a higher priority, however, with the Omega system featuring one of the better setups this month. For one thing, it worked without a hitch, which is sadly a strong bonus, and it is of pleasing enough quality to make a listening to your favorite audio CD a pleasurable experience. An Aopen MTRP sound card and a set of MS 203 speakers are responsible for this performance.

The last, and arguably most worthy, feature of the Omega is an internal 56K Dynalink modem. Combined with the provided AOL software, users can be surfing in no time flat. Though it is deficient in some areas, the PC View Omega 366 is an ideal home or office solution for the budget minded user wanting to catch up with the burgeoning technology revolution.

PC @UTHORITY

PERFORMANCE	★★★
FEATURES	★★★★★
VALUE FOR MONEY	★★★★★
OVERALL	★★★★★



## PIONEER Value System

**VERDICT** The fastest Celeron/333 on test, but let down by missing cables and poor build quality.

**PRICE** \$1,499

**SUPPLIER** Pioneer Computers Australia (02) 9690 2888

**P**ioneer Computers supplied for this Labs what at first appeared to be a well featured and tidy system. It is also the fastest Celeron/333 based system on test, but a few niggly little details have greatly handicapped what was otherwise a solid performer.

A stolid fascia houses all of the power and peripheral controls, as well as featuring a well recessed reset button. The case also features a handy slide out locking bar, to which can be attached a simple lock, thus rendering the innards of the machine inviolate from prying hands - handy for the ISS manager, or parent. Looking inside the case all cabling is well tied back, if a little haphazardly, but this is truly the least of the problems with the Value System's build quality.

The first problem isn't really apparent to most users until you try to play a game, or listen to some music. In short, you get no, even though adjusting the volume slider in the system tray still elicits the usual bleep. What is wrong is that there is no audio cable connecting the CD-ROM to the soundcard. This is an inexcusable oversight, and one that many users would be quite at sea over how to fix it. The second quality issue is even more problematic: the hard drive, one of the most sensitive components in a PC, is only secured by one screw in the Value System. With just a little force, the whole drive can be swiveled around. This could cause all manner of troubles during transport, and even lead to drive errors during operation if your desk is prone to shocks.

Missing or poorly constructed components aside, the Value System is a well featured machine. A Celeron/333 processor sits upon a Super Micro motherboard, along with 32Mb of RAM. With a 3.2Gb Quantum Fireball EX the system offers performance close to one of the Celeron/400s on test. 3D performance is particularly pleasing with the Forsaken demo reaching frame rates in excess of 80 frames per second, thanks to an 8Mb Diamond Viper V550 graphics card in the motherboard's AGP slot. The 15in Daewoo 518x monitor is another good performer; text is sharp and clear, while the screen is without any discolouration or obvious moiré patterns.

The Pioneer Value system deserved to do much better in our Labs. Its performance was well above the average recorded, and has a well selected range of peripherals, and yet the poor build quality of the machine lets it down greatly.

PC @UTHORITY

PERFORMANCE	★★★★
FEATURES	★★★★
VALUE FOR MONEY	★★★★
OVERALL	★★★★



## SPEAR TECHNOLOGY QDI DVD 333

**VERDICT** A well featured system with some great peripherals, though a little short on character.

**PRICE** \$1,499

**SUPPLIER** Spear Technology (02) 9904 8199

**U**pon first inspection it would appear that Spear Technology has provided quite a stylish system. A curvaceous front fascia in two-tone beige and slate grey makes the system look smart, and the curvy Logix monitor continues the impression of style. But one should never judge a book by its cover.

Like the majority of systems this month, the QDI sports a Celeron CPU, in this instance the 333MHz model. Also like the majority of systems this month, the processor is backed up 32Mb of RAM, the baseline for budget systems, but the advantages in money saved are paid for with decidedly lacklustre performance. Spear has supplied the system with one of its own QDI motherboards, which is also a disappointing choice. The board features only two DIMM slots, one of which is already occupied, and supports a maximum RAM capacity of 512Mb; this is pleasing, as more RAM would certainly boost the system's performance quite nicely for little effort. As for spare expansion slots, there are only three, one ISA and two PCI. As both sound and graphics chips are integrated into the motherboard, and considering that two of those slots share the one backplate, any user will have to be very careful about future expansions. A spare 5.25in bay and two 3.5in bays round out the internal options.

However, Spear deserve kudos for being the only company to supply its system with a DVD-ROM drive, and a six-speed Hitachi model at that. Unfortunately, the speakers and monitor limit the quality of playback. The Creative Vibra 16XV sound chip on the mainboard, in cahoots with the 120-watt speakers supplied, offer scratchy and hiss laden sound even at the lowest of volumes, even when on and not playing anything. The Logix monitor, while handsome and featuring an easily navigated OSD, is lacking in sharpness, though its colouration is quite vibrant.

The integrated ATI Rage IIC graphics chip is beginning to show its age, and fairly laboured through our 3D benchmarking, not only delivering poor frame rates in the *Forsaken* timedemo, but also distorting the colour palette of the game.

The Spear Technology QDI DVD 333 is an adequate system if you only wish to perform one task. More RAM is almost a necessity, and a better soundcard and graphics array would make it a useable games machine. As is, without any extra software but for a virus checker, the QDI is a machine lacking direction.

PC @UTHORITY

**PERFORMANCE** **FEATURES** **VALUE FOR MONEY** **OVERALL**



## TPG Celeron Office

**VERDICT** A quality system let down by lacklustre performance and a configuration that leaves you wanting.

**PRICE** 1,499

**SUPPLIER** Total Peripherals Group (02) 9850 0800

**B**uilding a sub-\$1,500 PC is never an easy thing. Compromises must be made to a greater or lesser extent. Unfortunately, the former applies in this case with the TPG Celeron Office fetching two stars across the board, landing it in company with the bottom half of this month's crop. Going down the well-trodden path of using a 333MHz Celeron CPU, the generically named Celeron Office failed to impress our benchmarks due to an obvious lack of resources, omitted for an equally obvious reason of price-point.

Housed in TPG's preferred desktop-style case, the Celeron Office imposes a substantial amount of desk space, but looks tidy and professionally presented. Lack of an available externally accessible 3.5in drive bay however (or an internal one for that matter), limits expandability somewhat. Inside the case is a neat array of tucked away cables and well assembled components with clearly accessible paths to the CPU, RAM and other vital organs. The P6L40-A4E motherboard is equipped with a technologically older Intel 440LX chipset supporting a maximum FSB speed of 83MHz (recommended for internal testing only) and a CPU clock ratio multiplier of 5.5, thus bringing the theoretical maximum clock setting to 456MHz. But the manual warns against this as it's considered over-clocking. The standard 66MHz bus caps off the motherboard's upgradeability to a processor running at 366MHz - hardly sufficient as an upgrade path, and rules out the Pentium II range above 333MHz as a future move also.

Hard disk storage, at 4.3Gb, is thankfully sufficient in a system at this price bracket, and is supplied through a quality Seagate Medalist Pro. Occupying the AGP slot is a CardExpert ST3D graphics adaptor utilising an S3 Trio3D accelerator and a less than inspiring 4Mb of onboard RAM. Though capable of a maximum resolution of 1,600 x 1,024 at 60Hz refresh, the 15in TPG 1569SE monitor limits the desktop to 1,280 x 1,024 like most others in this review. It's unlikely you'd want a higher resolution at a viewable screen size of 13.8in however. The 1569SE's OSD (On Screen Display) menu is easy to use though lacking in geometric calibrations, with only pincushion, trapezoidal and parallelogram adjustments on tap.

The system RAM draws from a relatively shallow pool of 32Mb, an obvious cost-saving measure but with RAM at today's low prices, it's surely worth spending the extra cash. TPG's excellent three year warranty is unmatched in this Labs.

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**PERFORMANCE** **FEATURES** **VALUE FOR MONEY** **OVERALL**

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## ULTIMATE P5400c

**VERDICT** Good combination of go-fast components help this system to perform well, but overall it is a less compelling package than the Omega or Vogue.

**PRICE** \$1,499

**SUPPLIER** Ultimate Computing Technology (03) 9584 2896

**B**eing one of only two systems in this month's comparison to feature a 400MHz Celeron processor, the 5400c, unsurprisingly, performed well in the benchmarks tests - particularly in the Forsaken demo where it achieved an impressively smooth 72 frames/sec. Part of its secret may also be due to the fact that the P5400c uses the Speed Award winning SuperMicro P6SBA motherboard (reviewed issue 16, p78) as its foundation. Though an entry-level model, this motherboard is well equipped for expansion with three ISA and four PCI slots along with AGP. It also supports up to 768Mb of PC100 RAM via three DIMM slots. Possessing an Intel 440BX chipset also means that the SuperMicro is future-proof as far as processors are concerned, supporting up to 600MHz. And not to mention a facility to accommodate two chassis fans in addition to the regular CPU cooler.

About the only thing that this system lacks is an extra 32Mb of RAM. In most other aspects of the configuration, the P5400c will satisfy the majority of users for some time to come. The case is a stretched out midi-tower design deep enough to swallow the longest of add-on boards. It also has the capacity to carry a total of four 5.25in drives. The 3.5in bays carry a payload of two drives leaving one externally accessible mount to spare. The three-panel case design means that accessing the internals of the PC requires only the side panel to be removed. Less pains for upgraders, particularly if you stash the PC under your desk.

Though Ultimate Computing duly noted the criticisms of using rubber bands to tie back its ribbon cables, its method of overcoming this practice ironically, draws another criticism. What UCT have effectively done is tailor the ribbon cables to suit the lengths required by the specific system. While the CD-ROM/hard drive IDE cable is fine, the floppy cable has had its connectors pulled off and repositioned further along the cable to extend its length. This leaves unsightly perforations across the cables, not to mention weakening and exposing each individual strand of wire.

Commendably, the P5400c is equipped with a well-performing S3 Savage3D graphics adaptor that benefits from 8Mb of RAM. The Hyundai DeluxScan 15in monitor lacks an OSD which limits its user controls, but otherwise delivers decent viewing for the money. The mouse though, is a definite cheapie. More attention to build quality should see UCT rate better in future Labs comparisons.



### PERFORMANCE



### FEATURES



### VALUE FOR MONEY



### OVERALL



## HITS AND MISSES

Tried and tested, loved and loathed. The Labs Team comments on objects of interest in this month's Labs

### SPEAR TECHNOLOGY QDI

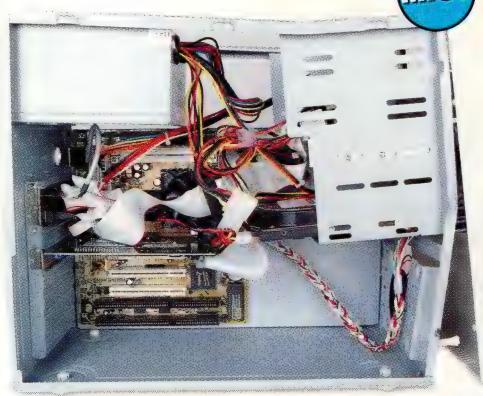


While the Spear Technology QDI system may not win any performance awards, it does come complete with one very cool feature. As anyone who has visited their local video store recently

might have noticed, DVD films are beginning to gain popular acceptance, and the inclusion of a 6-speed DVD-ROM drive in the aptly named DVD 333 is truly pleasing to see in the unit at this price point.

### ANSETT AIR FREIGHT

This month we had the opportunity to see the downside of having PCs shipped to your door. When we unpacked one of the systems from its box, we noticed that its front fascia was a little warped, and were curious to see what might be causing this; taking the case off the machine made



it quite obvious. The couriers, in this case Ansett, must have dropped the box holding the PC on a sharp edge, and the force severely buckled the internal supports of the system. Ansett came to assess the damage, and worked with the supplier to come to an arrangement. If your system arrives in any condition less than what you expect, always contact both your supplier and the freight carrier.

### ULTIMATE COMPUTING

**MISS** Even though the above system was in such a poor state of repair, all of its components were at least still well seated, unlike this month's offering from Ultimate Computing. There was a curious and somewhat ominous rattling noise coming from the mini tower, and when the case had been removed we were horrified to see that the processor had shaken loose in transit. This can only result from it being poorly seated in the first place, and is just plain sloppy.

# THE WINNERS

IN FACT, THIS MONTH WE'VE ONLY GOT ONE WINNER. READ ON TO FIND WHY THE CHOICE WAS ULTIMATELY A SIMPLE ONE.

## PC @UTHORITY LABS AWARD FOR VALUE AND SPEED



We've said it before, but it really does deserve reiteration: Also Technology has surpassed even our wildest expectations to provide a system that is incredibly fast and very well featured, and for an impressively low price. We had no choice but to bestow upon the Vogue 400 Plus both of our awards this month.

On the performance front, the facts

speak for themselves. The Vogue achieved an overall benchmark score in excess of most Pentium II 400s we've reviewed. The processor behind this is a so-called budget model Celeron/400, with 64Mb of RAM. On the ATC motherboard the combination is a dangerous one, and with the board able to handle a maximum of 384Mb of RAM, this system's performance has not even reached its full potential yet.

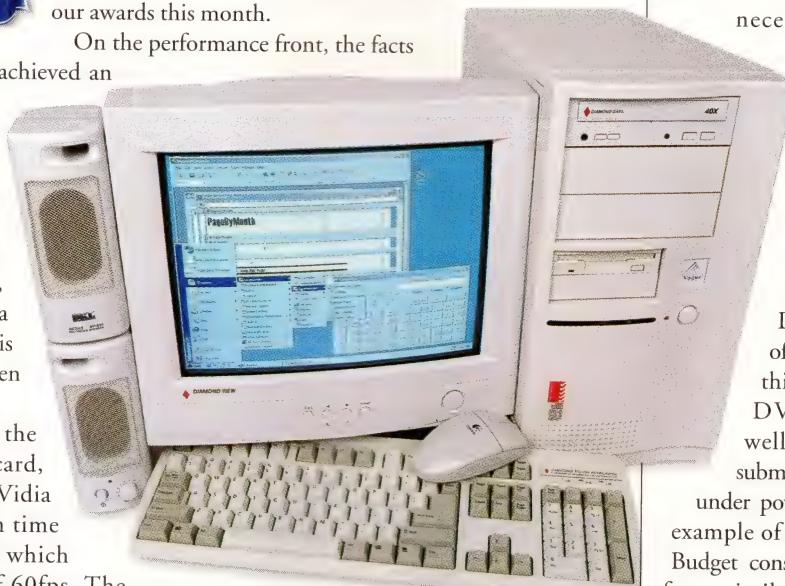
Another performance choice is the 16Mb Diamond Viper graphics card, using the popular and powerful nVidia Riva TNT chipset. The Forsaken time demo didn't even phase the card, which achieved frame rates in excess of 60fps. The Vogue's monitor, a Mitsubishi Diamondtron, is no graphics slouch either, providing a clear view of everything you might want to do on the Vogue at a crisp 1,280 x 1,024 at a solid 60Hz refresh rate. A Yamaha soundcard and DKL speakers bring up the audio rear, and a 56K modem makes the online world your oyster.

So of course the Vogue 400 Plus is fast, but with its extensive feature set, it's just about the best value you'll find in this Labs. Nearly all of the components are high quality, and the machine's internal layout is free of clutter and thoughtfully arranged. For \$1,500, the Also Technology Vogue 400 Plus is one of the highest quality machine's we've seen in a long while.

### MACHINE ALSO TECHNOLOGY VOGUE 400 PLUS

SUPPLIER Also Technology (02) 9519 4600

PRICE \$1,499 For more details see p54



## HONOURABLE MENTIONS

The Vogue 400 Plus has raised the bar almost impossibly high, leaving many machines behind in the dust. In almost any other budget Labs, these machines would have been admirable performers. The PC View system has a feature set that, while not particularly powerful, is capable of covering almost any home computing need, with an internal modem as well as a graphics card and good sound system. The tidy internal layout of the QDI machine is also noteworthy. Computers Direct also deserves mention for being the only supplier to include a Microsoft Intellimouse; anyone who has become accustomed to navigating around their desktop with that little rubber wheel will know how indispensable a good mouse can be.

## PARTING SHOTS

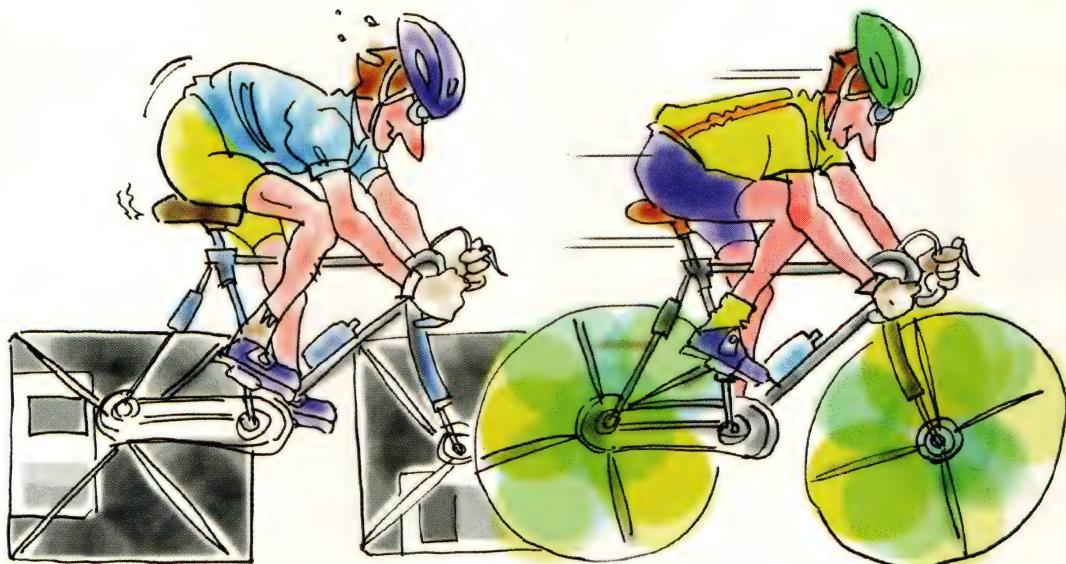
In any budget Labs, getting the most out of a price point is going to lead to cutting corners in one way or another. It is, or so we thought, impossible to supply everything with a PC under \$1,500, so the choice of what is necessary to make a good machine and what can go is a rather important one. Sometimes that choice is avoided, and a machine may be fully featured, albeit with lower quality peripherals. The QDI DVD 333 is an example of a PC wishing to do one thing (in this case handle DVD media) quite well. Computers Direct's submission, with its broad but under powered feature set, is an example of quantity over quality. Budget conscious consumers often face a similar choice, but with the added pitfall of avoiding those manufacturers and suppliers who take the third option to keep the price down - poor build quality and faulty devices. At least four systems in this Labs were unusable in some way. If a system that you purchase is likewise faulty, do not hesitate to take it up with your supplier.

## NEXT MONTH

We fly from one end of the computing spectrum to the other next month, and take the latest batch of high end PCs around the block. Whether you need the power to render complex 3D images or you want an office database server, we'll be looking for the right machine for you. Intel's latest golden child, the Pentium III, will be the focus of our PC Labs in the next issue, so tune in for some powerhouse PCs. ☀



# It's time you left the dark ages behind.



Floppies belong to a bygone era when files were small and expectations were low. Fortunately, there's a better answer for today's demanding world — Ricoh's new total CD solution. The new MP7040A drive from Ricoh writes CD-R and CD-RW discs at 4x speed and reads them at 20x. It comes bundled with Ricoh's new CLIPDISC packet writing software, which operates seamlessly within Windows 95/98, allows recording by the drag and drop method, and records instantly from the moment of command for unparalleled speed, reliability and ease. Swapping discs with friends and co-workers is a breeze, because the files you record are automatically saved in the

widely compatible ISO9660 format before disc ejection, making finalization unnecessary. For the ultimate in performance, use the MP7040A and CLIPDISC in combination with Ricoh CD-R/RW discs. It's the perfect solution for business and home in the computer age.



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AV530: ForteMedia FM801 PCI 3D Sound Card,  
AV310: Audio Excel 8330 Chipset 3D ISA Sound Card



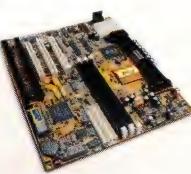
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# FEEL THE BURN

THE LABS TEAM TAKES NINE CD WRITERS FOR A SPIN,  
FINDING YOU THE TOP PERFORMERS OF THE LOT

Although the technology for burning CDs has been around since 1990, it has only been in the last couple of years that their price and performance have improved enough to make them a viable addition to desktop PCs. There are other technologies available for data backup and archiving that represent better value for money per megabyte than a CD, but there are few media types that match CD-R's flexibility. The main advantage of the CD format is that once burnt, the disc can be read on just about any PC that has a modern CD-ROM drive. This kind of compatibility base exists for no other medium, save the nearly obsolete floppy disk. This makes CD burning more than just a data backup or archiving utility, it makes it ideal for those with data that they want to distribute to other PC users without the fears of incompatibility or proprietary formats. Musicians can even burn their latest songs onto CDs that can be played in most audio CD players manufactured over the last few years.

CD-RW has also found itself with a significant role to play in modern computing. The flexibility that UDF (Universal Disc Format) and packet writing give to

CD-RW means that it is an ideal format for medium-term data backup or file transfer for those who don't want to spend a fortune on multiple CD-R discs. Even though some believe that the technologically superior DVD-RAM format will kill CD-RW and prevent it from ever taking off, the petty standards issues that have held DVD back for so long have enabled CD-RW to get a toe-hold on the market that DVD-RAM will need to eventually dislodge.

With prices for CD writers and CD media at an all-time low, and with the performance of drives increasing to eight-speed (1,200Kb/sec), if you are looking for a reasonably priced device for your data archiving and distribution needs, then a CD-R or CD-RW drive is well worth a look. Even though the varying DVD formats will undoubtedly make CD technology redundant in time, this is unlikely to happen soon. This month, we have taken a cross-section of the CD writer market and run them through our rigorous real-world benchmarks. So if you want to know the best and worst of what's on offer, then read on.

**Editor:** Valens Quinn

**Contributors:** Tim Dean, David Hollingworth

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Photography: Julian Hawkins



## SPECIFICATIONS & FEATURES

Manufacturer and model	Kodak 4802IDE	Philips CDRW400	PSI Pro 4x4x16	PSI Pro 6x24
● Price (inc. tax)	\$599	\$849	\$950	\$995
● Supplier	Kodak	Philips	Peripheral Sources Int.	Peripheral Sources Int.
● Phone	1800 674 831	(02) 9704 8311	(03) 9878 8611	(03) 9878 8611
● Internet	<a href="http://www.kodak.com">www.kodak.com</a>	<a href="http://www.pc.be.philips.com">www.pc.be.philips.com</a>	<a href="http://www.psiaust.com">www.psiaust.com</a>	<a href="http://www.psiaust.com">www.psiaust.com</a>
● Warranty	1 year	1 year	1 year	1 year
● Dimensions W x H x D (mm)	146x41x149	146x41x190	146x42x193	147x41x190
● Internal or External	Internal	Internal	Internal	Internal
● Technology	CD-RW	CD-RW	CD-RW	CD-R
● Interface	EIDE	EIDE	SCSI	SCSI
● Interface card supplied	N/A	N/A	I/O SCUD IOI-4203A	I/O SCUD IOI-4203A
● Cables supplied	IDE, audio, HiFi	IDE, audio	SCSI	SCSI
● Emergency eject	✓	✓	✓	✓
● Read speed (CD-ROM equivalent - Kb/sec)	8x	16x	16x	24x
● Write speed (CD-ROM equivalent - Kb/sec)	4x	4x	4x	6x
● Rewrite speed (CD-ROM equivalent - Kb/sec)	2x	4x	4x	N/A
● Access time (ms)	200	160	160	150
● Software included	CeQuadrat WinOnCD and PacketCD, GAZO	Write2CD, CeQuadrat PacketCD	Gear 4.2, Gear Audio, Gear Replicator, Gear WebGrabber	Gear 4.2, Gear Audio, Gear Replicator, Gear WebGrabber
● Media included	1xCD-R, 1xCD-RW	1xCD-R, 1xCD-RW	2xCD-R	2xCD-R
● Cache/buffer size	2Mb	2Mb	2Mb	2Mb
● Front panel sockets/controls	Headphone, volume, load/eject	Headphone, volume, load/eject	Headphone, volume, load/eject	Headphone, volume, load/eject
● Power switch	✗	✗	✗	✗

## CD WRITERS

### How we tested

CD writers are used for a variety of purposes including data and audio CD mastering, CD duplication, data archiving, data distribution and dynamic backup with CD-RW. These tasks demand different things from the CD recorder in performance terms so we have developed a range of tests that determine the strengths and weaknesses of the drives in these different areas. In general, all recording can be broken up into two broad categories depending on whether you are burning many small files, such as if you are backing up documents or images from your hard disk, or just a few large files such as in audio discs or burning a large video onto CD for distribution.

Reading CDs can also be broken up into the same two broad groups but there is also the seek time of the laser to take into account. A slow seek time means that reading multiple files will be slower than a few large files. If you use your CD for presenting slideshows of images then a fast seek time is essential. We have also included some tests to assess the drive's ability to perform these kinds of tasks. All drives were tested alongside a Kodak 4802IDE (reviewed issue 16, p103) that is used as a yardstick drive, representing recent CD writer technology. A Mitsubishi Diamond Data 40-speed CD-ROM also performed the read tests to give you an idea of how the

drives compare in reading to a standard \$100-\$150 CD-ROM drive.

### Multi file backup and restore

In this test a single 200Mb directory, containing over 2,000 files of various sizes including word documents, excel spreadsheets, access databases, sound files, various image formats and raw text documents, is burnt onto the CD and timed. This represents the drive's performance in any task where many files must be accessed simultaneously and burnt to disc. The files were then restored from the burnt CD to determine the drive's ability to read many files of various sizes.

### Single file backup and restore

A single 220Mb AVI file is burnt to the CD testing the drive's ability to handle a long sustained data transfer without experiencing buffer under-runs. This represents burning only a few large files to disc as would be done for video or audio distribution. The AVI was then copied back to the system from the disc to test the drive's sustained data transfer rate when reading.

### Zip backup and restore

When archiving or backing up a large amount of data it is common to use a compression program to compress the data into a smaller space. The 200Mb

Ricoh  
MP7040A  
VALUESmart and  
Friendly  
CD Rocket  
SPEEDSmart and  
Friendly  
CD  
TurboWriterYamaha  
CRW4416EVK

Ricoh MP7040A VALUE	Smart and Friendly CD Rocket SPEED	Smart and Friendly CD TurboWriter	Yamaha CRW4416EVK
\$599 Protac Australia (02) 9637 8999 <a href="http://www.protac.com.au">www.protac.com.au</a> 2 years 146x41x193 Internal CD-RW EIDE N/A IDE X 20x 4x 4x 120 Adaptec Easy CD Creator and DirectCD, Photo Genie, DIY 98 1xCD-R, 1xCD-RW 2Mb Headphone, volume, load/eject X	\$1,499 Verbatim Australia (03) 9823 0999 <a href="http://www.verbatim.com.au">www.verbatim.com.au</a> 1 year 149x42x195 Internal CD-R SCSI Adaptec AHA-2902 SCSI ✓ 20x 8x N/A 220 NTI CD-Maker Pro, Sonic Foundry CD Architect, Diamond Cut DC-Art, Macromedia Backstage Designer Plus, MediaPath MediaAgent, ECI Disk Inspector Pro, Adaptec Easy SCSI 1xCD-R 2Mb Headphone, volume, load/eject X	\$1,169 Verbatim Australia (03) 9823 0999 <a href="http://www.verbatim.com.au">www.verbatim.com.au</a> 1 year 149x42x195 Internal CD-R SCSI Adaptec AHA-2902 SCSI ✓ 24x 6x N/A 150 Adaptec Easy CD creator and Easy SCSI, Sonic Foundry CD Architect, Diamond Cut DC-Art, Macromedia Backstage Designer Plus, MediaPath MediaAgent, ECI Disk Inspector Pro 1xCD-R 2Mb Headphone, volume, load/eject X	\$799 Yamaha Music Australia 1800 805 413 <a href="http://www.yamaha.com">www.yamaha.com</a> 1 year 146x41x193 Internal CD-RW EIDE N/A IDE, audio ✓ 16x 4x 4x 180 Adaptec Easy CD Creator and DirectCD 4xCD-R, 1xCD-RW 2Mb Headphone, volume, load/eject X

multi file directory was compressed using WinZip 7 and was then burnt to CD. From there it was decompressed straight from CD back to the hard disk representing the drives performance in backup tasks.

#### Paint Shop Pro browse

Paint Shop Pro 5 has a feature to browse a directory and present thumbnails of all the images within it. A Kodak PhotoDisc containing 100 high-resolution images was browsed and timed. This pushes the drives seek time and random access capabilities.

#### Slideshow

The Kodak PhotoDisc includes a feature where all the images on the disc can be displayed in a slideshow. We chose a one-second interval so the drive does not engage in a solid transfer but it doesn't have time to rest before the next image is called for. This also tests the seek and random access speed of the drive.

## Ratings explained

### STAR RATING

★★★★★	EXCELLENT
★★★★★	VERY GOOD
★★★★	GOOD
★★★	AVERAGE
★★★	POOR
★★★	WORST



**Speed:** Awarded to the CD writer with the fastest overall performance.



**Value:** Awarded to the CD writer offering the best value for money.

**PERFORMANCE** How fast was the burner, in both creating and reading CDs?

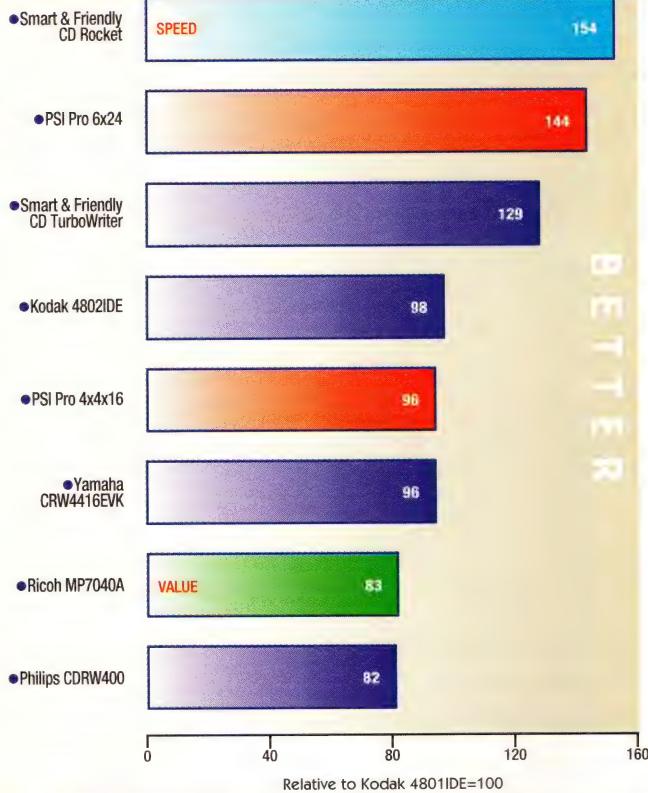
**FEATURES** Are the basics all there, and how many extra bells and whistles have been included?

**VALUE FOR MONEY** A combination of quality, features and price.

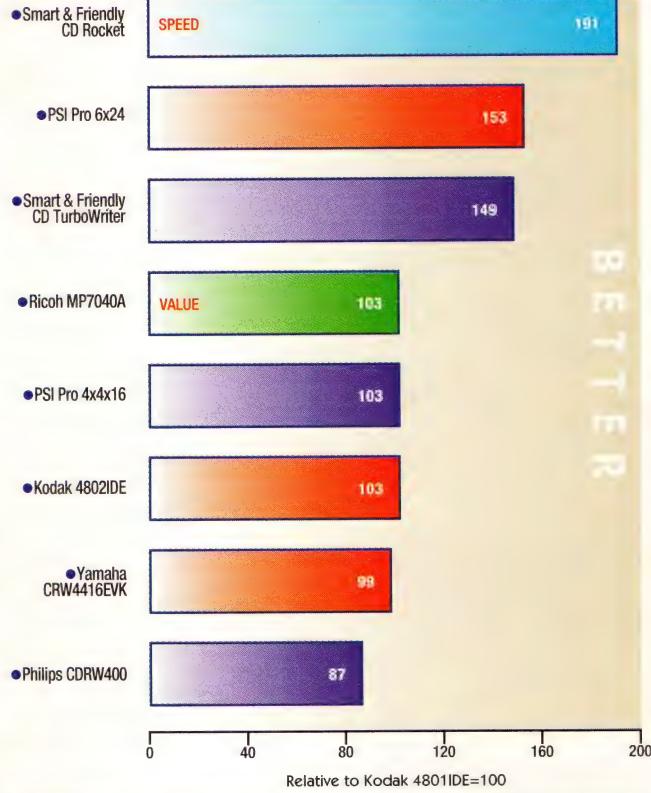
**OVERALL** The blend of all the ratings to produce a balanced choice.

# PERFORMANCE MEASUREMENTS

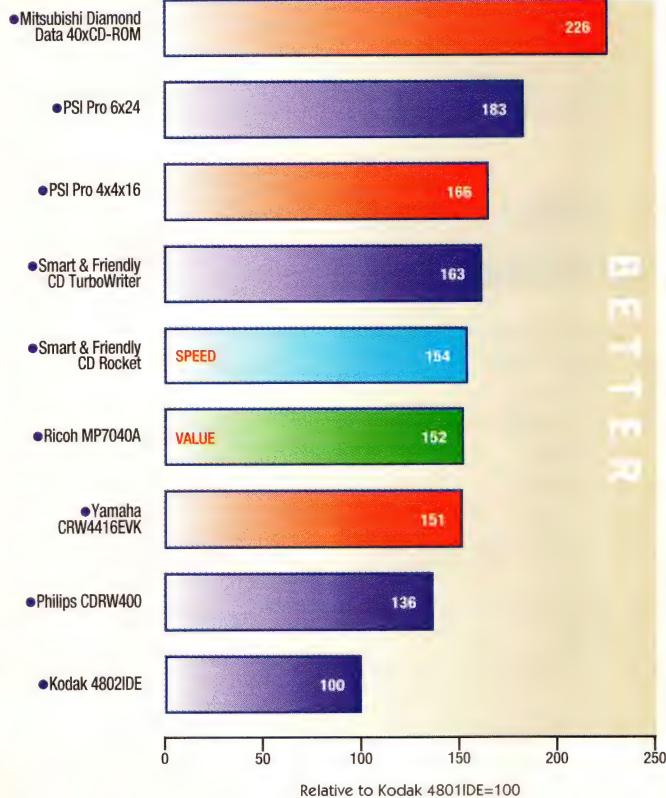
## MULTIPLE FILE RECORD



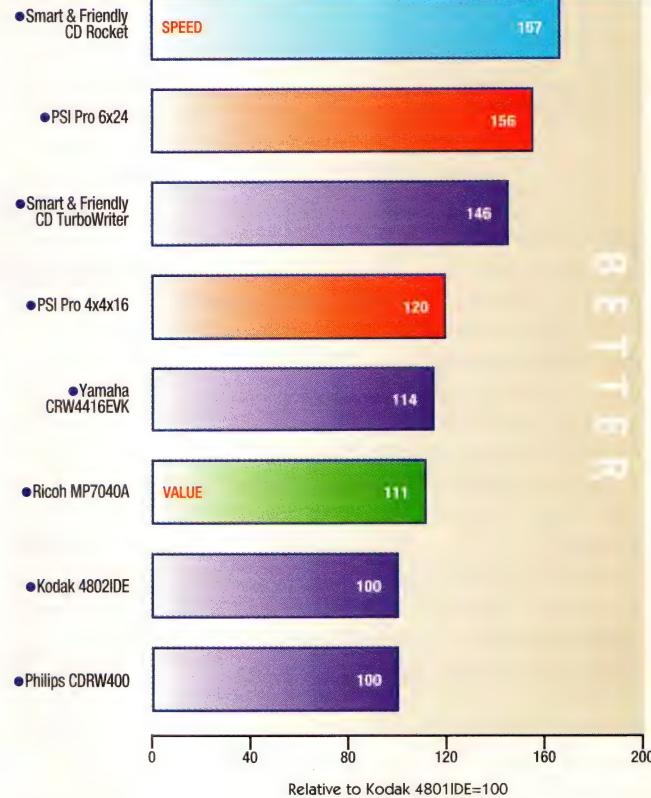
## SINGLE FILE RECORDING



## READ SPEED



## OVERALL





## JARGON BUSTER

### CD EXTRA OR CD PLUS

A disc containing a number of audio tracks in the first session, and one CD-ROM XA data track in the second session. An alternative mode for combining standard CD audio, and a computer application, on a single disc.

### CD+G

A special disc format in which simple graphics and text are stored in the sub-channels of an audio disc. A special player is required to read and display this information.

### CD-DA

Compact Disc-Digital Audio. Jointly developed by Philips and Sony and launched in 1982, CD-DA was the first incarnation of the compact disc. The standard under which CD-DA discs are recorded is known as the Red Book.

### CD-I

A compact disc format developed by Philips, designed to allow interactive multimedia applications to be run on a player attached to a television. The standard document defining CD-I is called the Green Book.

### CD-R

Compact disc-recordable. When referring to recordable discs, 'CD-R' is often used to refer to write-once discs, in contrast to CD-RW.

### CD-ROM

Compact Disc-Read Only Memory. A standard for compact disc to be used as digital memory media for personal computers. The specifications for CD-ROM were first defined in the Yellow Book.

### CD-ROM XA

'XA' stands for Extended Architecture. CD-ROM XA is an extension of the Yellow Book standard, but designed to add better audio and video capabilities so that CD-ROM could more easily be used for multimedia applications.

### CD-RW

CD-ReWritable. CD recordable media which can be erased and re-recorded. CD-RW media can only be written in a CD-RW recorder, not in a normal CD recorder. A CD-RW recorder can also record standard CD-R discs.

### CD TEXT

An audio CD format in which up to 5000 characters of disc information (title, artist, song titles, etc.) is written into the disc Table of Contents. This information is displayed when the disc is played back on CD Text-enabled players.

### CD-WO

Compact Disc-Write Once. A rarely used term for recordable compact discs.

### COASTER

Popular term for a ruined recordable CD, named after the ubiquitous household item for keeping coffee rings of your furniture.



## KODAK 4802IDE

**VERDICT** A reasonable budget drive with CD-RW capabilities but slow compared to most drives on test.

**PRICE** \$599

**SUPPLIER** Kodak 1800 674 831

**K**odak's 4802IDE looks quite similar to and has many features in common with its older brethren, the 4801IDE, which impressed us as being a capable and affordable CD-R drive a couple of months ago (issue 16, p103). The main difference between the 4802IDE and the 4801IDE is that the former handles re-writable media in addition to the usual WORM (Write Once Read Many) CD-R media. Its speed in reading and writing normal CD-R disks is the same as the 4801IDE: eight-speed and four-speed respectively, and it can write to CD-RW discs at two-speed. While this CD-RW speed is quite slow, especially considering that all the other CD-RW capable drives on test can run at four-speed, the price is at the level of the 4801IDE a couple of months ago, so it is still good value.

Kodak uses an IDE interface as opposed to SCSI, keeping the overall cost down and removing the need to install a separate SCSI card in the system. Installation is a simple as screwing the drive in a free 5.25in bay using the provided screws, and then connecting the IDE cable to a free IDE channel on your motherboard. In addition to the usual audio cable, Kodak has also supplied a HiFi cable. Since the drive we received was an early production model and the full manual was not provided, there were no instructions on the cable's use. It is assumed that the small jack on one end goes into the headphones or your sound card output and the RCA jacks connect to your stereo giving you an ad hoc CD player.

Performance for a four-speed writer is very good, with the 4802IDE just managing to outperform all the other four-speed drives on test. Unfortunately, reading at only eight-speed means that the 4802IDE is significantly slower than all the other drives on test when it comes to reading. Furthermore, the 2-speed re-write speed makes formatting CD-RW media a very time consuming affair. This means that the drive is best suited as a supplementary drive to a fast CD-ROM drive since it is definitely too slow in reading terms by today's standards. With its low price, however, adding \$100 to \$150 for a fast CD-ROM becomes a viable option.

CeQuadrat's WinOnCD and PacketCD software are used for mastering and incremental writing which, along with the GAZO imaging software, presents a solid starting package. Considering its low price, the Kodak 4802IDE makes a fair budget drive although the similarly priced

Ricoh MP7040A from Protac has significantly better performance and is hence better value.

PC AUTHORITY

**PERFORMANCE**



**FEATURES**



**VALUE FOR MONEY**



**OVERALL**





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accurate  
to just plain  
brilliant.



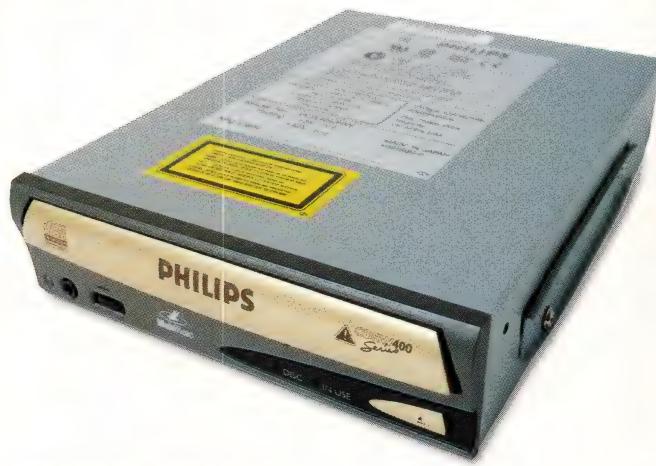
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## PHILIPS CDRW400

**VERDICT** A competent CD-RW drive with good features but overpriced and outperformed in this Labs.

**PRICE** \$849

**SUPPLIER** Philips (02) 9704 8311

From the front the Philips CDRW400 looks very distinctive, with a metallic finish on the drive door and the load/eject button, and a dark grey facia. All the normal controls are present including a headphones jack, volume wheel and two status indicators, one showing whether there is a disc inserted and another showing whether the drive is busy. The drive uses an IDE interface and comes supplied with one IDE and one audio cable. The manual goes through the installation and operation of the drive and includes a short troubleshooting section if anything should go wrong.

Further indicating that CD-R only drives are on the way out, the Philips CDRW400 is one of the new breed of drives to feature four-speed re-writing along with four-speed writing and 16-speed reading. Unfortunately, the CDRW400 performed poorly in the benchmarks compared to the other four-speed recorders. Taking a total of eight minutes and 27 seconds to record the 200Mb multi-file CD, the CDRW400 was a full one minute and 20 seconds slower than the fastest four-speed recorder, the Kodak 4802IDE. It also performed at a similarly poor level with the single 220Mb AVI file making it the slowest CD recorder on test. Fortunately being a 16-speed reader and 4-speed re-writer, the Philips fares better than the eight and two-speed Kodak overall, but not my much. Considering the relatively high price of the CDRW400, this is quite disappointing.

CD mastering software is Philips' own Write2CD which, thankfully, detected the CD recorder first try, unlike other packages offered with drives which often need to be patched in order to work with the drive at all. Write2CD has a glitzier and graphically intensive interface than similar packages from CeQuadrat or Adaptec, although the software is quite intuitive to use. The more advanced features are either tucked away or missing making the software suitable for fairly basic burning tasks only. CeQuadrat's PacketCD, using the UDF (Universal Disk Format), is provided for incremental writing and allows you to format a CD-RW and drag and drop to it just like it was another drive on your system. With this format deleted files do not actually free up space on the CD-RW and the disc needs to be completely formatted in order to free up space.

The CDRW400 is a capable drive but its poor performance and fairly high price ultimately take it out of the running in this Labs.

The Ricoh MP7040A from Protac is \$250 cheaper, faster and thus presents better value for money.

PC @UTHORITY	PERFORMANCE	★★★★★
	FEATURES	★★★★★
	VALUE FOR MONEY	★★★★★
	OVERALL	★★★★★



## PSI PRO 4x4x16

**VERDICT** A well very well featured SCSI drive with CD-RW capabilities and good performance.

**PRICE** \$950

**SUPPLIER** Peripheral Sources International (03) 9878 8611

Upon opening the nondescript PSI Pro box, we noticed that the 4x4x16 capable drive mentioned on the box is actually a Yamaha CRW4416, except in a SCSI version. Like the 6x24, the 4x4x16 comes with a SCSI-3 PCI card: the I/O SCUD, which is well documented and sports both an internal 50-pin connector and an external HD 50-pin connector, so it can be used with another external SCSI device such as a backup drive or scanner. The drive itself has the same front panel as the IDE CRW4416 and features the usual headphone jack, volume control, load/eject button and two status lights. Installation of the SCSI card and drive were fairly easy and Windows detected the drive immediately. The testbench system did report the drive as D: and moved the already installed CD-ROM drive back to E: but changing around the reserved drive letters in Device Manager fixed the problem immediately.

Being SCSI, performance in the benchmarks was superior to the IDE CRW4416E, although the differences in recording times overall are minimal. The main performance improvement comes when reading files from the CD. In addition to providing four-speed recording, the 4x4x16, as the name implies, can also re-write discs at four-speed. This enables you to use incremental packet writing and use a CD-RW disc to dynamically backup your data on the fly, since you don't waste around 10Mb of space each time you burn.

The 4x4x16 comes with Gear 4.2 which includes several components covering most CD burning tasks. Gear itself does the mastering, while Gear Audio handles music and audio CDs, Gear Replicator is a disc copy program and WebGrabber downloads whole Web pages to CD. While not quite as popular as Adaptec's Easy CD Creator, Gear is a fully featured application and should be more than adequate for most users. Unfortunately as supplied, Gear did not recognise the drive, requiring a patch downloaded from the Internet before it did recognise the drive. We were provided with the patch on a CD from PSI and hopefully all drives will either ship with up to date software or with the patch on disc, if not users without Internet access may be left out in the cold.

Considering the performance and the features of the drive, the price of \$950 is reasonable, and if you need a burner with re-writable capabilities, the PSI Pro 4x4x16 is a good choice. The Protac Ricoh M7040A is only a little slower overall and is significantly cheaper however.

PC @UTHORITY	PERFORMANCE	★★★★★
	FEATURES	★★★★★
	VALUE FOR MONEY	★★★★★
	OVERALL	★★★★★



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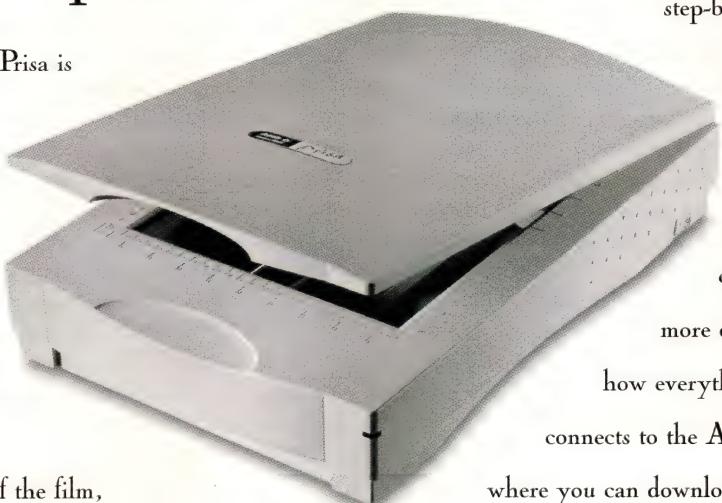
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### Creativity & productivity.

Our powerful package of software delivers art, creativity as well as productivity directly to your desk, be it in the office or at home.

The MiraScan driver speeds the scanning procedure as well as improving the quality of the image.

While iPhoto Plus helps you create impressive documents for either work or simply for good, old-fashioned fun.

And text documents can be scanned using TextBridge's OCR software for easy editing.

### A positive out-of-the-box experience.

Setting up the AcerScan Prisa (available with either a SCSI or USB interface) is very user-friendly with a step-by-step poster that

guides you through the procedure.

There's also an HTML-formatted electronic manual for a more detailed explanation about how everything works. This connects to the Acer Peripherals' web site where you can download the latest driver as well as get service information.

Clearly, our new scanner is way ahead of the competition. To find out more, take a look at [www.servex.com.au](http://www.servex.com.au)

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## PSI PRO 6x24

**VERDICT** A very fast SCSI six-speed CD-R drive but lacking in re-writable features.

**PRICE** \$995

**SUPPLIER** Peripheral Sources International (03) 9878 8611

**C**oming in an identical box to the PSI Pro 4x4x16, the only thing to tell the 6x24 apart are two small stickers on the box indicating its read and record speeds. The drive itself is a Teac manufactured CD-R56S and proudly sports a sticker stating that it can handle an impressive six-speed recording. Unfortunately, in speed terms, the PSI Pro 6x24 has been beaten to the mark by the Smart and Friendly CD-Rocket which gets all the way up to eight-speed recording. Since most drives are still in the league of four-speed recording, the 6x24 managed an excellent score in the recording benchmarks and even managed to edge out the only other six-speed drive in the Labs, the Smart and Friendly CD TurboWriter. In addition to this accomplishment, the 6x24 came out a clear winner in the reading side of the benchmark proving that the drive could quite comfortably handle being your system's primary CD-ROM drive. Of course, you need a second drive to be the source for copying CDs anyway and since a fast (36-speed or faster) CD-ROM drive only costs a bit over \$100, having an extremely fast CD burner is not usually a big priority. Also the 6x24 is a CD-R only and is not capable of burning re-writable CDs reducing its usefulness as a backup device.

Contributing to its terrific speed is the fact that it is SCSI based as opposed to IDE. The 6x24 comes with the same unusually named I/O SCUD PCI SCSI card as the other PSI drive, the 4x4x16. This card installed easily and all drivers and cables are supplied to get you going right away. While Windows detected the CD-R without trouble, unfortunately the CD mastering software, Gear 4.2, had some initial troubles. Thankfully PSI supplied the patch to get Gear up to date with the drive, and hopefully all drives will be shipped with the update. The manual is also minimal with only installation instructions for a generic drive and little specifically for this drive.

The Gear mastering suite consists of Gear 4.2 itself, Gear Audio, Gear Replicator and Gear Web Grabber, which burns entire web sites to CD for off-line browsing. Gear is a powerful suite, although not quite as easy to use as Write2CD or Adaptec Easy CD Creator.

Considering its excellent performance of the 6x24, it would be an ideal choice for an individual who does a lot of burning and who does not have much need for the re-writable features of other drives, such as if you are engaging in the limited distribution of your own music CDs.

PC @UTHORITY	PERFORMANCE	★★★★★
	FEATURES	★★
	VALUE FOR MONEY	★★★
	OVERALL	★★★★



## CD-R AND CD-RW

### CD-R

outlined in the Orange Book II standard in 1990, CD-R represents the WORM (Write Once Read Many) technology that has gained popularity over the last couple of years. Normal CD-ROMs work by having a laser read small pits and flat surfaces that represent the binary numbers 1 and 0. The pits are pressed into an aluminium layer which is sandwiched between plastic protective layers. Unfortunately once pressed, this layer cannot be changed and the data on the disc is fixed for ever more. With CD-R discs the aluminium layer is replaced by an organic dye layer that starts off being homogeneously reflective, in that there are no pits in it. The CD recorder uses a laser to burn a 'pit' into the dye which, when reaching a critical temperature, goes from being reflective to being opaque. The opaque 'pits' have the same reflective properties as a pit on a normal CD-ROM so it can be read by a normal CD-ROM drive.

The colours of a CD-R are determined by the type of dye used: either cyanine (cyan coloured) or phthalocyanine (almost colourless); and the type of reflective layer placed behind the dye: either silver or gold. Thus if you have a gold backing with phthalocyanine the disc will be gold on both sides, or with cyanine it will be gold on one side and green on the other.

CD-R is most useful for permanent archiving of data, duplication of CDs or the limited distribution of data, video or audio CDs. The fact that most CD-ROMs manufactured in the last two years (called multiread) can read CD-R discs make it an excellent medium for transporting data to just about any other PC.

### CD-RW

In 1997 the Orange Book III standard was laid out by several leading manufacturers worldwide, including Sony, Hewlett-Packard, Ricoh, Philips and Mitsubishi. This standard represents CD-RW discs, which stands for Compact Disc-Re Writable. Where CD-R media use a layer of organic dye that can only have its properties changed once, CD-RW has a layer consisting of a crystalline compound that maintains some quite special properties when heated to the right temperature. At low temperatures the compound is stable and is either in a crystalline state with high reflectivity or an amorphous state with low reflectivity. When sufficiently heated by a laser and quickly cooled, the compound changes state from amorphous to crystalline. What makes the disc re-writable is that a lower power laser can then warm the compound and cool it slowly causing it to revert to an amorphous state, ready to be written again.

Until the development of the UDF, or Universal Disc Format, each time data was written to a CD there would be an inevitable amount of wasted space, often as much as 10Mb. With UDF packet writing becomes possible where writing can be performed with any amount of data and very little of the disc is wasted. This makes CD-RW media especially useful for dynamic backup or a transport medium that can also be played on most recently produced multiread CD-ROM drives.

Tim Dean



## RICOH MP7040A

**VERDICT** Not the fastest around but at \$599 its overall flexibility makes it a worthy Value Award winner.

**PRICE** Protac: \$599; Ricoh: \$799

**SUPPLIER** Protac (02) 9637 8999; Ricoh (02) 8977 1111

The same Ricoh MP7040A drive was supplied to us by both Protac and Ricoh Office Automation, and while they differ only slightly in software bundle, they differ quite dramatically in price. While Ricoh is offering the drive for \$799, which seems a reasonable price for a drive of this specification, Protac is offering the same drive, with additional software, for \$200 less. At the \$799 price the drive represents good value for money, but at \$599 the drive is equal cheapest on test with the Kodak 4802IDE and represents outstanding value for money.

The MP7040A is an IDE drive that features four-speed writing, four-speed re-writing and 20-speed reading. Being IDE the unit is very easy to install, assisted by a fairly thorough manual, which even includes an internal diagram of the drive for those who are interested. There are only three jumpers to worry about and everything is clearly marked on the back of the drive including where pin one is on the IDE port. The front facia is fairly conventional and includes a headphone socket, volume control, load/eject button, a single status light and emergency eject button.

With both drives you get Adaptec's popular Easy CD Creator, and unlike some other drives on test, the drive worked with the software first time without a hitch. Also included is Adaptec's Direct CD which is used on CD-RW disks to allow incremental writing. The Protac drive also includes Photo Genie which can be used to organise images into albums and then dynamically burn them onto a CD-RW. There is also Data Extend CD backup software and a disc called CD-R/RW DIY 98 which is a guided tour of the CD technology.

Performance of the drive in the benchmarks was strong with the single file record, where it topped the pack of four-speed recorders, but was poor for the multi file record where it performed around the bottom of the pack. Reading speed is fairly good, with the drive coming in the middle of the pack as tested. The addition of four-speed re-writable capabilities gives the drive flexibility, and considering the price, is an excellent inclusion to its feature set.

Considering the drive has reasonable performance and a worthy software bundle, at Protac's price of \$599, it represents unparalleled value for money. For those looking for a CD burner with re-writable capabilities with plenty of flexibility and can handle not owning the fastest burner on the block, the Protac Ricoh MP7040A is unbeatable value.

PC @UTHORITY

PERFORMANCE	★★★
FEATURES	★★★★
VALUE FOR MONEY	★★★★★
OVERALL	★★★★



## SMART AND FRIENDLY CD Rocket

**VERDICT** Incredible performance and a huge software bundle but you pay a premium for the speed.

**PRICE** \$1,499

**SUPPLIER** Verbatim Australia (03) 9823 0999

The name 'CD Rocket' could be seen as just being another example of hyperbolic marketing speech. In this case, however, the Labs team did find themselves examining the drive for some kind of liquid oxygen tank or orbital boosters, because the CD Rocket is quite simply that fast. With a maximum recording rate of eight-speed, the CD Rocket blitzed all the other drives on test in the recording benchmarks and comes out a clear winner overall in performance terms. With 20-speed reading capabilities, the CD-Rocket has no problem restoring files either. Since eight-speed recording is such new technology, however, you must be sure that you are using media that supports this high speed. The Kodak CD-R media that we used for testing, while stating that it supports eight-speed, would not burn at maximum speed on the CD Rocket. Of the media we had on hand, we found that the Verbatim and Philips media also did not run at eight-speed but the Ricoh and Yamaha discs worked without a problem. As eight-speed drives become more prolific over the coming months you can expect to see more media become available that supports this speed.

The SCSI adaptor provided is an Adaptec AHA-2902 PCI, which installed through Plug and Play in Windows 98 right away. The drive was easy to set up, with the SCSI jumpers clearly marked on the drive itself, and was detected by Windows and the mastering software without a problem. The software package is certainly impressive, in fact the box claims there to be over \$US1,500 worth. Included is NTI CD-Maker Pro (although the external version of this drive ships with Adaptec's Easy CD Creator), and a host of utilities for enhancing, editing and burning audio and music files, Macromedia Backstage Designer Plus for Web authoring, MediaPath MediaAgent for tracking the usage of CDs, and ECI Disc Inspector Pro. There is more than enough to keep even advanced users busy, especially if you are interested in mastering your own audio CDs. Also thrown into the package are a special CD marking pen and a mousepad.

The only drawback of the CD Rocket is the fact that you inevitably pay a premium for the latest in technology. At \$1,499 the drive is the most expensive on test by a considerable margin, but you certainly get what you pay for in terms of performance and features. If you need the fastest CD burner available, you're not interested in CD-RW capabilities, and you don't mind forking out some cash, then the CD-Rocket is an excellent choice.

PC @UTHORITY

PERFORMANCE	★★★★★
FEATURES	★★★★★
VALUE FOR MONEY	★★★★
OVERALL	★★★★

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# **COMPUTERS THAT MEAN BUSINESS**



## SMART AND FRIENDLY CD TurboWriter

**VERDICT** A speedy drive with heaps of software but there are better value choices available.

**PRICE** \$1,169

**SUPPLIER** Verbatim Australia (03) 9823 0999

**T**hough not quite as impressive as its brethren the CD Rocket, the CD TurboWriter also deserves its title due to its capacity to read at 20-speed and write at a fast 900Kb/sec or six-speed. While the CD Rocket represents the latest in technology, it also has a correspondingly high price. Since six-speed technology has been around for a little longer than eight-speed, the TurboWriter doesn't command quite as high a price as the CD Rocket, although at \$1,169 it is the second most expensive unit on test. The TurboWriter is also SCSI, which makes it more expensive than an equivalent IDE drive, but generally delivers superior performance. Included with the drive is an Adaptec AHA-2902 PCI SCSI card that features an external connector in addition to the internal connector for the CD drive.

Performance in the benchmarks is understandably swift, although not as fast as the comparatively featured and identical looking PSI Pro 6x24 manufactured by Teac. In both the multi file and single file recording tests the TurboWriter performed significantly better than the four-speed drives but performed several seconds slower than the PSI Pro 6x24. In fact, the TurboWriter was outperformed by the 16-speed PSI Pro 4x4x16 in the read tests even though the TurboWriter is rated as a 20-speed drive. This still represents a significant level of performance, although for the price the PSI 6x24 Teac drive is better value.

The TurboWriter comes with an extensive software bundle with Adaptec's Easy CD Creator at its core. Also included is PowerQuest Drive Image, which, as its name implies, allows you to back up your entire hard disk to one or more CDs. This is a useful utility, although if you are planning to back up often then a CD-RW or dedicated backup drive may end up being a more economical option. There are also several utilities for creating your own audio and music CDs including Diamond Cut Audio Restoration Tools which is used to prepare audio files to be burnt to CD by applying noise reduction and other enhancements. Also thrown in is a nifty CD marking pen and mousepad.

If you are looking to purchase a fast CD burner, and you don't require CD-RW capabilities, then the CD TurboWriter is a competent choice. Given the impressive software bundle and included SCSI card, the package is well featured and delivers strong performance. The main drawback is the high price. At \$995 the PSI Pro 6x24 drive is not quite as well featured but exhibits superior performance for a lower price.

PC @UTHORITY

PERFORMANCE	★★★★★
FEATURES	★★★★★
VALUE FOR MONEY	★★★★★
OVERALL	★★★★★



## YAMAHA CRW4416EVK

**VERDICT** Reasonable performance but just outclassed in terms of value.

**PRICE** \$799

**SUPPLIER** Yamaha Music Australia 1800 805 413

**Y**amaha produce a variety of computer-related products that are often rebranded by other companies, as is the case with the CRW4416 and PSI, who distribute the SCSI version of the CRW4416 as the PSI Pro 4x4x16. The CRW4416E is an IDE drive that is capable of four-speed CD recording, four-speed re-writing and 16-speed reading. Being IDE the drive is very easy to install since there is no SCSI card necessary. The manual takes you through installation and the operation of the drive, and whilst not being the most comprehensive manual around, it should help even the most inexperienced users get up and running with a minimum of fuss.

Unfortunately, while the drive installed in Windows without any problems, the Adaptec Easy CD Creator mastering software had some troubles with the drive. When either testing or burning a CD, using any media, all would start well enough, but the burn would eventually abort with a series of I/O errors. Using other CD burning software, such as Gear 4.2, the drive was detected and had no problems burning CDs. This may have been an anomalous problem with this particular drive and software, however, and Yamaha technical support assured us that they have not had any problems with the drives to date. It might still be prudent to call Yamaha and confirm that there are no problems or incompatibilities with the drive before making a purchase.

The Adaptec software is powerful and easy to use and can do most tasks from duplicating a CD, to mastering your own data, audio or mixed media CD, or formatting a CD-RW using UDF enabling it to be used like another drive on your system.

Performance in the benchmarks was average for a four-speed recorder and a 16-speed reader, and as such, it cannot compete with the six or eight-speed recorders or 24-speed readers. The CRW4416E still maintains enough speed to be more than adequate for most small volume CD burning tasks and the incremental writing of CD-RWs is very useful, especially if you have some large files to move somewhere, but you don't want to use up an entire CD-R forever.

Given the price of \$799, the CRW4416E is reasonably priced considering its capabilities, but unfortunately, in this competitive Labs, the Protac Ricoh M7040A is \$200 cheaper and maintains similar levels of performance and features. Even so, assuming that any bugs are ironed out, as Yamaha assure us they have, the CRW4416E would still make a worthy purchase.

PC @UTHORITY

PERFORMANCE	★★★★
FEATURES	★★★★★
VALUE FOR MONEY	★★★★★
OVERALL	★★★★★

# THE WINNERS

THE LABS TEAM SPUN A HOST OF CD WRITERS THROUGH THE MOTIONS, AND FOUND THE BEST OF THE LOT.

## PC @UTHORITY LABS AWARD FOR SPEED



Speed awards are usually quite hotly contested, but this month saw one machine burn away from the pack. The Smart and Friendly Rocket actually lived up to its grandiose name, burning and reading CDs faster than any other machine in this Labs by a wide margin.

While burning, the Rocket has an impressive eight-speed recording rate, so fast that some CD media can't keep up with it. Restoration is a likewise fast affair, with the rocket able to play

back your data at a very respectable 20-speed rate.

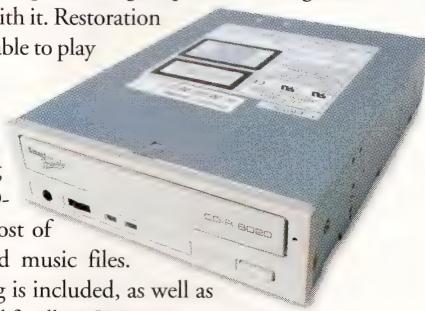
Installation is a breeze, with Windows 98 recognising the Adeptec SCSI adaptor right after the initial install. A wide selection of software rounds out the package, making the Rocket as good a purchase as it is a fast drive. NTI CD-Maker Pro probably takes pride of place, as well as a host of utilities for enhancing, editing and burning audio and music files. Macromedia Backstage Designer Plus for Web authoring is included, as well as MediaPath MediaAgent for tracking the usage of CDs, and finally ECI Disc Inspector Pro.

Although the Smart and Friendly Rocket is an expensive unit, in fact it is the dearest machine on test, you do get a great burner backed up by excellent software. If performance is more important than having change in your wallet, the Rocket is for you.

### CD WRITER SMART AND FRIENDLY CD ROCKET

**SUPPLIER** Verbatim Australia (03) 9823 0999

**PRICE** \$1,499 For more details, see p74



## PC @UTHORITY LABS AWARD FOR VALUE



This saw a rather strange development. We received identical burners from both Protac and Ricoh - the Ricoh MP7040A. It was actually a point of some contention as to whether we should include both drives, but the vast price difference and software bundle made it worthwhile to include both.

Ricoh's package is well featured and priced, but is quite eclipsed by the Protac package. At \$599 the Protac version is both \$200 cheaper, and includes more software. Clearly a value winner.

The Ricoh writes and re-writes CDs at a four-speed rate, pretty much the current standard speed. Actually reading CDs is performed at a respectable 20-speed, placing it up there with our Speed winner, the Smart and Friendly Rocket; benchmark performance was understandably strong, even topping the four-speed pack in some areas. Installation of the drive, being IDE, is quite easy, and made even easier by the inclusion of well-written manual, and internal diagrams of the unit, should they be necessary.

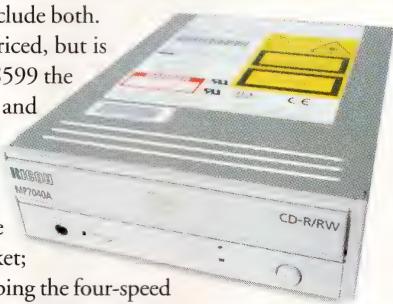
The software package included with the Protac machine is very impressive. Addeptec's Easy CD Creator is included, as well as Photo genie, for burning image collections onto CD, and Data Extend backup software. Of interest to those who really want to know, another CD is included offering a thorough run through on CD technology.

Protac's blend of Ricoh performance and a well featured software bundle make a clear argument for being the Value choice for this Labs. We don't disagree.

### CD WRITER RICOH MP7040A

**SUPPLIER** Protac (02) 9637 8999

**PRICE** \$599 For more details see p74



## HONOURABLE MENTIONS

When it comes to providing heaps of features, the PSI Pro 4x4x16 deserves credit. As a SCSI device, it's good to see that the PSI Pro comes with a speedy SCSI-3 PCI adaptor. The SCSI interface also means that you will be able to install additional SCSI devices, and it boosts performance over that of the Yamaha CRW4416EVK, which shares the same internals. In addition, the Gear 4.2 software gets you started, and it will also write to RW discs.

## PARTING SHOTS

Even with the looming threat of obsolescence in the face of DVD-RAM, CD-RW is gaining in popularity. In fact, since the costs of developing a CD-RW drive are not significantly higher than a CD-R, many manufacturers are opting to add CD-RW functionality to their CD-R drives, as is the case with Kodak's 4801IDE and 4802IDE drives. Whether CD-R and CD-RW will become 'popular' media depends on when DVD-R and DVD-RAM become readily available and when prices drop to consumer levels. Regardless of this, both CD-based media have the tremendous advantage over DVD because they are compatible with just about any PC with a CD-ROM drive manufactured in the last couple of years. 1999 and 2000 should prove to be pivotal years in determining the future of disc based media.

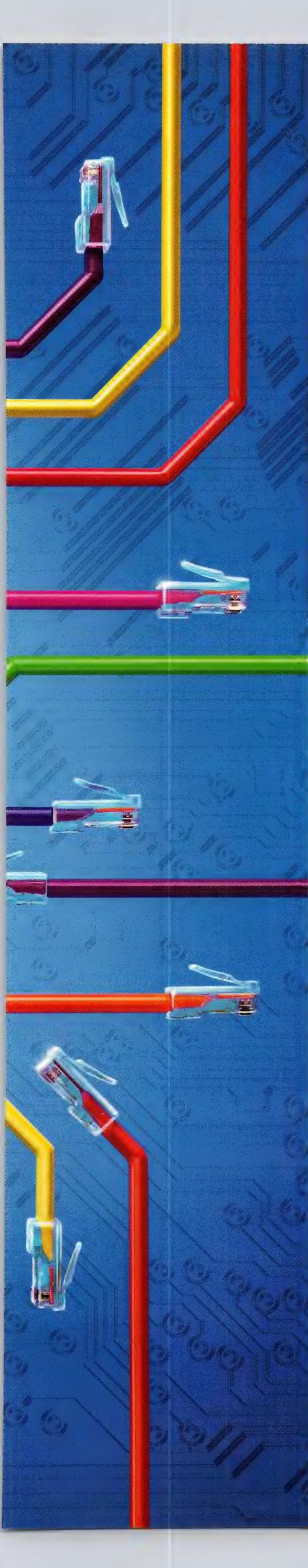
## NEXT MONTH

It's an essential task that just about everyone will have to do at one time or another - upgrade their hard disk. Next month, we round up the latest, largest, fastest and cheapest hard disks. Don't miss it!





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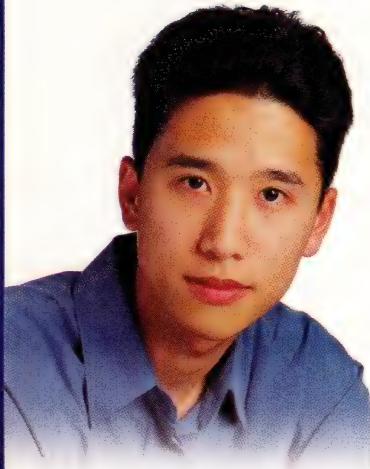
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# REVIEWS

## A new Explorer



*Simon Tsang looks  
at the angst ridden  
release of IE 5*

Internet Explorer 5 is upon us. Released on the 18th of March amid the usual flurry of controversy befitting a Microsoft launch, we now have the latest installment in the epic saga that is the browser war. But predictably, it was the controversies which took precedence over new features and benefits in the days following the official launch. The first of which to roll off the press was that of Microsoft's claim that IE 5's record one million downloads within the first five days of release more than tripled IE 4's figures. Fine and dandy, except for the fact that Microsoft also claimed a record 1 million downloads in just two days when IE 4 was launched back in October 1997. The truth soon came to light that Microsoft admitted that it pulled a shifty back in '97 and also counted incomplete downloads which by far was the majority.

The next contention came in the form of users who were ticked off by versions of the browser which were modified by content providers through IE 5's customisation feature. Dubbed as 'cobranding', these versions typically carry the content site's logo, related links, starts in its home page and in some cases include add-ons and icons. The customisation feature is Microsoft's marketing tool to attract Web portals and content sites to encourage users to download IE 5, as the browser becomes a flashing billboard for the provider. It seems however, that users didn't want to be stuck with cobranded versions and were fuming after having spent precious Internet hours downloading the browser only to realise it had been customised by the content provider after installing it.

Another issue was raised over a discovered privacy bug in IE 5 which allows Web site operators to read a user's clipboard. And the headlines continue to roll in.

Despite being handed my copy of IE 5 officially by Microsoft at the Press launch on a shiny new CD, I held back from installing it on my otherwise relatively stable workhorse office PC, having been bitten by Microsoft's '.0' version bug once too many times. I've spent far too long configuring my system exactly the way I want it, to have it all crumble under obscure error messages and blue screens of death.

After a few days though, I eventually gave in out of curiosity and a sense of duty as an IT journalist and decided to give IE 5 a try on my less mission-critical notebook. While I was at it, I decided to go the whole hog and experience it the way most users would, downloading the entire browser from scratch. Rather than downloading a single compressed self-extracting file that you can install at any time as with previous versions, Microsoft requires you to first download a small executable file which then initiates an automated download/installation procedure. I found this annoying as it robs users of choice in the way they would like to install software. The required components are automatically downloaded and installed without user intervention. This is obviously instrumental to IE 5 'record' downloads as users will have to pull down a copy of IE 5 on every system they wish to install it on, being no longer able to keep a copy on their system. To its credit though, the installation in my case was seamless and the download procedure saves a shortcut on your desktop to resume the download if it was terminated for any reason. In the end, it took me numerous tries and countless hours to get the whole lot down.

But the most compelling improvement in IE 5 for me is its integrated support of multiple languages. The radio bar is novel in concept but requires a clean 56K connection. I'll be looking forward to how Netscape responds when Communicator 5 is released towards the end of this year.

## What's hot – and what's not

### DELL PRECISION 610

When Pentium III meets Xeon, you get, well... the Pentium III Xeon. With 80Mb graphics memory on tap, the Precision 610 gets the heart pumping. Defibrillators ready... turn to page 84



### PALM V

Slimmer, lighter and rechargeable. Palm improves on almost every aspect of a successful formula and finally has the looks to live up to its popularity. Get the feel for PDA's hottest property on page 90.



### ORB 2.2 GB

Removable storage has a new player. Fast, cheap and easy-to-use, the ORB drive delivers the lowest cost-per-megabyte backup medium next to tape. Page 94 has all the details.



# THIS MONTH'S SELECTION



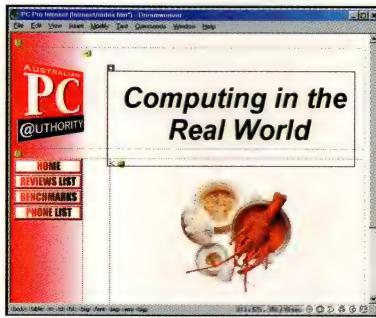
▲ If only PCs were built like this!



▲ The world's favourite SuperFloppy now available in 250Mb.



▲ Canon's latest high-end digital camera shakes up the competition.



▲ The latest version of arguably the industry's best Web authoring package gets the thumbs up.

## Ratings explained

### STAR RATING

★★★★★	EXCELLENT
★★★★○	VERY GOOD
★★★★○○	GOOD
★★○○○○○	AVERAGE
★★○○○○○	POOR
○○○○○○○○	DREADFUL

**FEATURES** Not just the quantity on offer, but are they up to scratch and do innovative features deliver?

**PERFORMANCE** More than just raw speed, how well does a hardware product do its job?

**EASE OF USE** How good is the documentation and training? Can you get up to speed quickly?

**VALUE FOR MONEY** A perfect product is one that's sold at a competitive price.

**CONTENT** How in-depth is the subject matter? Is the CD interesting and informative?

**DESIGN** Does the book read easily? Can you find whatever you need quickly?

**OVERALL** A weighted collation of all the scores.



**Excellence:** a product with no equal at the time. Unrivalled quality and value.



**Recommended:** if you're buying, then any product with this stamp should be on your shortlist.

### PCs & NOTEBOOKS

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# APPLE POWER MACINTOSH G3

Stylish design and a modest amount of power make the G3 worthwhile.

## APPLE G3/400

**VERDICT** An innovative design in ergonomic and aesthetic terms as well as representing a significant amount of computing power. A high price and lack of broad software base still hinder the G3 however.

**PRICE** \$5,495

**SUPPLIER** Apple 13 36 22

**INTERNET** [www.apple.com](http://www.apple.com)

**AVAILABILITY** Now

**SYSTEM SPECIFICATIONS** G3/400 processor, 1Mb backside L2 cache, 128Mb PC100 SDRAM, 9Gb IBM Ultra2 LVD SCSI hard disk, Adaptec AHA-2940U2B Ultra2 LVD SCSI adaptor, 24-speed CD-ROM, 16Mb ATI Rage 128 graphics card, 15.1in TFT Apple Studio Display, integrated Crystal 16-bit audio, integrated 56K modem, integrated 10/100Mbit Ethernet, OS 8.5.1.

The most noticeable thing about the G3 Macintosh is the case design, which represents a fusion between the smooth lines and translucent finish of the iMac and a more conventional desktop box. While the aesthetic qualities of the case strike you first, it is the design innovations that make the most lasting impression. Featuring handle-like protrusions at each corner, the G3 is extremely easy to manoeuvre and can be physically moved about quite comfortably. The most impressive feature, however, is that the entire right-hand panel of the



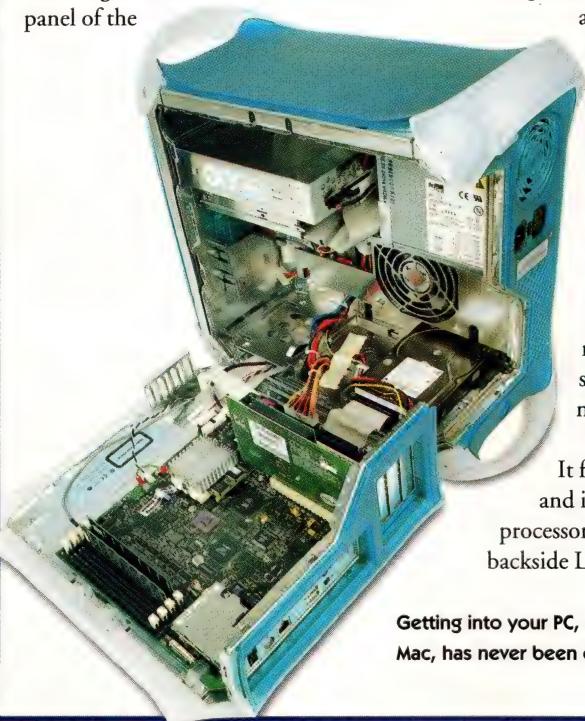
case opens and exposes the entire interior of the G3 to your inspection. This is made possible by the motherboard being mounted on the side panel that opens and not on the fixed panel inside. This means that unlike a PC where you generally have to dig your way through cables and the structure of the case in order to reach any internal components, all the components on the G3 are right there, unobstructed in front of you when you open up the case. While most PC or Mac owners will never venture into the innards of their computer, those who do get their 'fingers dirty' will immediately appreciate the implications of this design. Changing any peripherals is now a trivial task and not a momentous venture as it can sometimes feel like when maintaining or upgrading a PC.

The G3 is not all looks though. It features an impressive specification and is based around the latest G3 processor running at 400MHz. The backside L2 cache (which is very similar to the L2 cache on the Dual Independent Bus on a Pentium II

or III processor) on the G3/400 is a huge 1Mb, double that of equivalent Pentium processors. Couple this with 128Mb of SDRAM and the G3 represents a significant amount of computing power.

Since Apple has not adopted AGP technology, the graphics card resides in a special 66MHz PCI slot, twice the speed of the conventional 33MHz slot. Most Macs produced in the past couple of years, including the iMac, have featured graphics cards that, while quite adequate for most business tasks, have been vastly underpowered in 3D compared to equivalent cards available for PCs. This is certainly not the case with the G3 which sports an ATI Rage 128 (reviewed p92) with 16Mb of RAM on board. This card is currently the most powerful 2D/3D graphics card available. Even with the imminent release of the 3Dfx Voodoo3 and nVidia Riva TNT-2, which will both almost certainly outperform it, the Rage 128 is an excellent card and indicates that the G3 truly has matured into a viable gaming platform.

A variety of monitors are available for the G3 and the model I tested came with an excellent 15.1in TFT Apple Studio Display. Image quality is excellent and can be easily configured through a dedicated tab in the Monitors and Sounds Control Panel.



Getting into your PC, even if it is a Mac, has never been easier.



Maximum resolution is a comfortable 1,024 x 768 at 75Hz which is suitable for most tasks. The design is also excellent with the more complicated of the two available bases being very easy to position and there are even small indents in the base for storing the keyboard when not in use. Viewable angle is very good with the screen being fairly bright and clear at angles of up to nearly 180 degrees, although there is a slight ghosting effect when moving objects on screen.

The storage sub-system also has a very impressive specification. At its core is an Adaptec AHA-2940U2B Ultra2 LVD SCSI card attached to a 9Gb IBM 7,200rpm Ultra2 SCSI hard disk. This combination delivers excellent I/O performance and would be an adequate foundation for a video or sound editing suite. Supplementing this is a relatively conventional 24-speed CD-ROM, although DVD-ROM versions are also available.

At the back of the case there are inputs for the usual ADB (Apple Desktop Bus) along with USB but there are also two Firewire ports. Firewire, also known as IEEE-1394, is a high bandwidth bus that is especially suited to tasks like digital video.

Performance is excellent for a system of this class. I ran both the G3 and a Pentium II/400 of a similar specification through a lengthy test in Photoshop 5 using several processor, RAM and hard disk intensive filters, colour mode changes and file format saves, and the G3 performed at a level nearly 50 per cent faster than the Pentium II. Unfortunately for Apple, the recent release of the Pentium III has meant that Intel still holds the desktop performance crown, although this may change if Apple keeps up the pressure.

Many of the components are integrated, which means that there is plenty of space left for upgrading. The 16-bit Crystal sound chip, 56K modem and 10/100Mbit network adaptor are all integrated into the motherboard. This leaves two PCI slots free along with two 3.5in hard disk bays and a Zip drive bay under the CD-ROM drive.

Disappointingly, Apple has chosen to omit the floppy drive from the G3 specification as it did with the iMac. In the case of the G3, I can see no sufficient justification for this omission. With the

iMac we were told that due to space constraints, manufacturing costs, the inherent limitations of the floppy medium and the advantages of the Internet and networking, that a floppy drive was undesirable. Even with these reasons I was not satisfied, and with the G3 there are no space or significant cost constraints to speak of. In fact, I began writing this review on the G3 but had to stop when I realised that I had no way of transporting the text to my editor and I was forced to write the review on a PC. I feel that the floppy drive, whilst representing obsolete technology,

is still a complementary medium to the Internet and networking, and they are not mutually exclusive.

The keyboard and mouse are the same as are found on the iMac and utilise USB connectors. While having a comfortable action, the keyboard is a little cramped and a few keys, such as the del key, have been omitted and the arrow keys have been reduced in size. Whether you like the mouse is also a matter of personal taste since some people find it difficult to orient it correctly because it is completely round and there is no way to simply 'feel' where up is.

Overall, the G3 represents a significant step forward for Apple, and some will say for computing in general, because here is a computer that has actually been designed with real people in mind. Revolutionary indeed.

Considering the performance and high specification of the G3 it is not surprising that it comes with an equally high price tag. For general purpose computing the PC still holds an edge in price and software compatibility, but with many software developers seriously reconsidering the Mac as a viable platform, things may change in the next year or two.

At the very least I would like to see some PC manufacturers take heed of the many strengths of the G3 and start to think a bit differently themselves, and make a few much needed innovations in ergonomics and aesthetics.

*Tim Dean*

PC@UTHORITY	PERFORMANCE	★★★★★
	FEATURES	★★★★★
	VALUE FOR MONEY	★★★
	OVERALL	★★★★★



## Second Opinion

While last autumn's launch of the colourful iMac made it clear that Apple was very serious about the 'think different' credo, not everyone was satisfied. Dissenters talked about underfed specs and the triumph of style over substance. Power users knew that the iMac wasn't aimed at them, and it didn't interest them. This is where the new G3 comes in.

Those old criticisms aren't just going to go away. Even if the G3 eventually ships in a range of colours, the design won't please everyone, particularly those that mutter about plastic looks.

Sadly there's not much potential for drive expansion. While there's a compartment for an optional Zip disk, and two bays for optional SCSI hard disks, you can forget additional IDE devices.

My first negative impression of the G3's mouse and keyboard (both of which I first saw with the iMac) hasn't disappeared. The small, round mouse isn't ideal and, while the feel of the keyboard isn't bad, its lack of page navigation keys and a forward delete will be felt by heavy Word users. Apple might maintain the line that more mouse buttons confuse bewildered users, but that doesn't explain why the right-mouse button functions that Windows users take for granted have been relegated to tricky Ctrl-Click combinations.

Despite what Mac evangelists claim, MacOS is far from perfect. Over the past month I've taken the effort to use the G3 and, in general, it's comfortable. I definitely miss Outlook 98 - Microsoft still hasn't bothered with a Mac version - and the memory management leaves something to be desired. I really shouldn't have to allocate memory to applications in order to get the best performance from them.

Lastly, the pricing needs to be addressed. For the cost of this G3, I could afford a top-spec Pentium III/500 system, complete with a 19in monitor, 128Mb of RAM, decent speakers, and quite possibly some bundled software. The G3 is certainly an impressive and innovative system but, when it comes to the bottom line, the price simply doesn't match the specification.

*Stuart Andrews*

# DELL PRECISION 610

## PENTIUM III XEON

**VERDICT** Dell has produced a well engineered and powerfully featured beast for the truly high end user.

**PRICE** \$14,330

**SUPPLIER** Dell Computers 1300 303 148

**INTERNET** [www.dell.com.au](http://www.dell.com.au)

**AVAILABILITY** Now

**SYSTEM SPECIFICATIONS** Pentium III XEON 500MHz, 1Mb L2 cache, 256Mb ECC SDRAM, Dual CPU support 9GB LVD SCSI Hard Drive, 80Mb Intense 3D Wildcat Graphics Card, integrated sound chip with SRS 3D sound, IntelliMouse, Keyboard, SCSI CD-ROM, 17in High Scan Dell Monitor, Windows NT v4.0 SP4.



Dell's latest offering for the high end workstation and server market is riding right at the bleeding edge of technology, featuring the new Pentium III Xeon/500 processor.

Apart from housing the fastest processor we've seen in the Labs, the Precision also features a top-rate graphics card array and it is all encased in one of Dell's immaculately engineered cases. Well, it didn't score the coveted PC @uthority Recommended Award for nothing.

The Precision's case is of the usual 'tool free' Dell design. I cannot praise the sturdiness and accessibility of this case enough; like Apple's new G3, one button releases the side panel, revealing what at first appears to be a rather cramped interior. Another button then releases the case's front fascia, which is itself pleasingly curvaceous. With free access to the interior, this is where the fun starts. The power supply sits right over the board, but swings up and out on a metal tray, for maintenance both of the supply itself and the components beneath it. The various front bays are likewise easily accessible. The hard drive is mounted

sideways on its own pull out tray, and the CD-ROM and floppy drive are on similar mounts, sliding in and out for upgrade or maintenance. With all this sliding and moving metal, you might expect the odd cut or two, but each piece of the frame is machined quite smooth, and is blessedly free of sharp corners or burred edges. For those tech types who fright at the idea of actual users being so easily able to mess about in their machines, the Precision also features a tab that can hold a normal padlock.

Sitting on the oversize motherboard, the PIII Xeon/500 is surrounded by high quality components, with still more room for expansion. 256Mb of RAM provides the Xeon with enough raw power to truly leap into the high end of workstation applications, while 3D apps are taken care of by an enormous Intense 3D Wildcat graphics card. The card takes up the AGP slot and one PCI slot, leaving two normal PCI slots, an ISA slot, and a special extended PCI slot with extra

contacts. Perhaps unsurprisingly, the Precision can take a maximum of 2Gb of RAM in four DIMM slots.

As I've already mentioned, the graphics card in the Precision is something to behold. It is in fact two cards, one slotted in above the other and attached by a short length of ribbon cable. Two giant heat sinks dominate the cards' underside, dissipating the energy generated by the 80Mb of RAM on board - a 16Mb frame buffer and 64Mb of texture memory. An extra wide bus connects both sets of memory, while DirectBurst technology further increases

A quality case and a superb graphics array round out an excellent workstation.

graphic performance. Maximum resolution of the card is 1,280 x 960 at a super steady 85Hz on a normal aspect monitor. On a monitor with a screen aspect of 5:4 (as opposed to 4:3), the card maxes out at 1,280 x 1,024. On the other end of the monitor cable sits a 17in Dell High Scan monitor, with a noteworthy 0.25 dot pitch, and capable of resolutions up to 1,600 x 1,200 with 16.7 million colours.

Performance was, of course, impressive. Our NT benchmarks were completed almost universally in a matter of seconds; watching the progress bar speed across the screen during a particularly intense Gaussian Blur in Photoshop was a real treat. Likewise Lightwave offered little challenge to the Precision, and our Microsoft Access tests didn't even cause the machine to break a sweat. The PIII Xeon is well suited to the kind of high end graphics and math that our benchmarks test; the SIMD Extensions of the PIII add further benefits to streaming media and net apps, and the 1Mb of secondary cache on this particular model offers boosted performance with especially large data sets and other math intensive tasks. See the lead story in the Horizons section (p22) for more info on the PIII Xeon.

At \$14,430 the Dell Precision 610 is not an investment for everyone. Even many professional users may not require as much computing power as this machine offers, but if you want the best, we haven't seen anything to surpass the Precision.

David Hollingworth

PC @uthority

PERFORMANCE



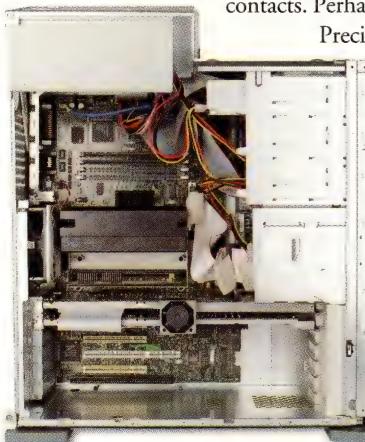
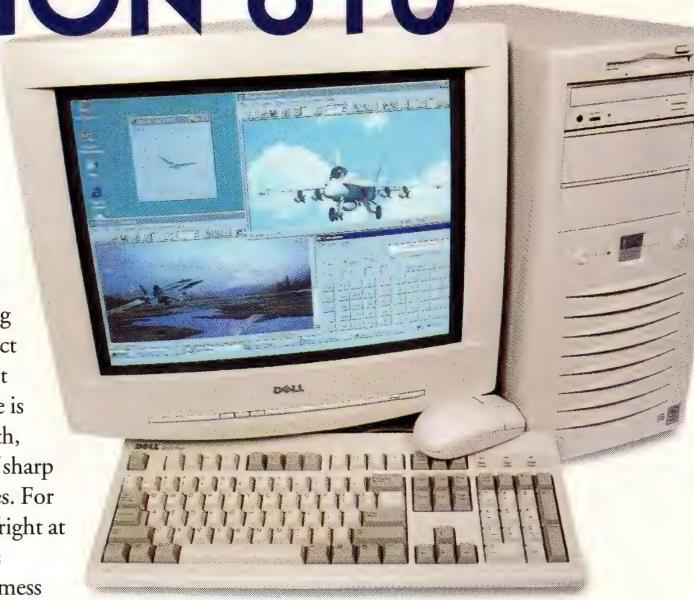
FEATURES



VALUE FOR MONEY

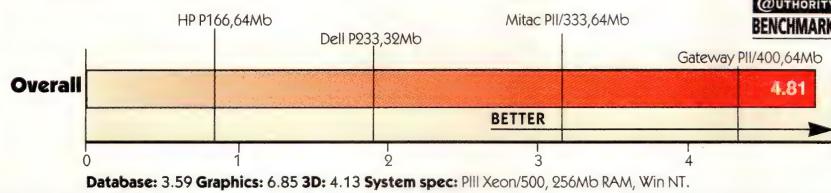


OVERALL



## Speed tests Dell Precision 610

All the computing power you want.



# EMACHINES ETOWER 366i

## CELERON / 366 PC

**VERDICT** A well-rounded specification and a very low price but not terribly powerful and lacking in upgrade potential.

**PRICE** \$1,299

**SUPPLIER** Peripheral Sources International (03) 9878 8611

**INTERNET** [www.e4me.com](http://www.e4me.com)

**AVAILABILITY** Now

**SYSTEM SPECIFICATION** Celeron/366 PPGA, 128Kb L2 cache, 32Mb SDRAM, 4.3Gb Samsung hard disk, 24-speed Samsung CD-ROM, 4Mb ATI Rage IIC AGP graphics chip, Crystal SoundFusion 16-bit sound chip, HPS MicroModem V.90 internal modem, 15in emachine monitor, passive satellite speakers, Windows 98, Microsoft Works.

Once you take the small etower out of its box you are led through setting it up care of a simple but detailed fold out guide. Setup is also made easier since all the cables are colour coded on the system itself and match the installation guide. Instead of the usual Windows 98 CD-ROM, you get a bootable Restore CD that can either reinstall Windows for you or format your system and start from scratch with a fresh installation.

The specification for the etower is quite impressive considering the low price. A Celeron/366 with 32Mb of RAM makes up its core and represents more than enough power for the home user who just wants to use the Internet, do some word processing and run educational software for the kids. For more demanding tasks you will require more RAM, and there is a spare DIMM slot just for this with a maximum of 256Mb. The processor comes in the new PPGA (Plastic Pin Grid Array) shape that is reminiscent of the older Socket 7 format. There is little performance difference between the Slot 1 and PPGA versions of the Celeron, and the PPGA version is cheaper to manufacture, resulting in a saving for the end user. Performance of the etower in the PC @uthority Benchmarks is between the level

of an average Pentium II/266 and Pentium II/300.

The motherboard occupies most of the small case and is a Micro ATX form factor. This means that you get a board with all the advantages of ATX, such as softswitch power, in a mini tower case. Several components are integrated into the motherboard further saving on cost and keeping the interior of the case clear and uncluttered. An ATI Rage IIC with 4Mb of RAM resides on the motherboard, and while not being the most powerful graphics card around, performs its task admirably. Unfortunately, the Rage IIC is simply outclassed when it comes to 3D and gaming, and the etower scored an unplayably low 11 frames per second at 640 x 480 resolution in the Forsaken Direct 3D test. If you are interested in gaming, however, the low price will make the additional purchase of a dedicated 3D add-on card, like a 3Dfx Voodoo2, feasible, in which case you could expect rates of over 100 frames per second. Unfortunately, while the integrated ATI Rage IIC uses AGP, there are no AGP slots in the system so you will not be able to take advantage of its higher bandwidth and extra features, like sideband addressing, if you end up purchasing a new graphics card. The 15in emachine monitor is also adequate and can handle a flicker-free 85Hz refresh rate with a clear image at 800 x 600 resolution. The maximum resolution is 1,024 x 768 where it can only manage a flicky 60Hz, which is not recommended for long periods if you wish to avoid eye strain.

The Crystal SoundFusion sound chip is also integrated into the motherboard. While

A well featured machine for the user who wants an inexpensive route onto the net.



having a fairly basic specification, and lacking in fancy features such as 3D positional audio or multiple speaker support, the SoundFusion is adequate for most home and non-demanding audio tasks. The SoundFusion chip feeds into a tiny pair of passive satellite speakers. Although not terribly loud, again they are sufficient for most home tasks.

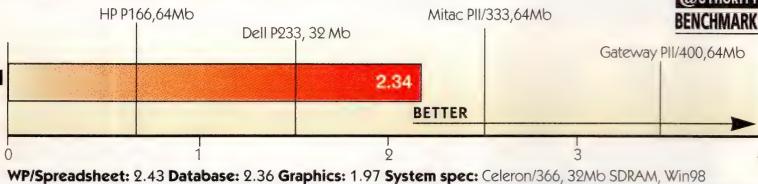
Inside the case is spacious considering the small size of the case itself, but there is not a lot of room for upgrades. With only two PCI and two ISA slots, and with the 56K V.90 modem occupying one of the PCI slots, there is not a lot left for further peripherals. There is also only one 5.25in bay available for additional drives. Most home users will not be concerned with the lack of upgrade potential of the etower since it already has everything you need for basic computing, but your future options may be limited.

30 hours of free Internet access with AITnet rounds out the etower package. For the price of just under \$1,300 you will be hard pressed to find a more consolidated package tailored to the home user. You do get what you pay for, however, and the etower's components do not represent the latest in PC technology. Unfortunately, for a budget machine, the upgrade potential is also small making it inappropriate as a base for future expansion. If you are looking for a budget, no-frills machine for around the home, then the etower is well worth a look.

Tim Dean

## Speed tests eMachines etower 366i

Not amazingly fast but ample for home use.



WP/Spreadsheet: 2.43 Database: 2.36 Graphics: 1.97 System spec: Celeron/366, 32Mb SDRAM, Win98



PC @UTHORITY

PERFORMANCE

FEATURES

VALUE FOR MONEY

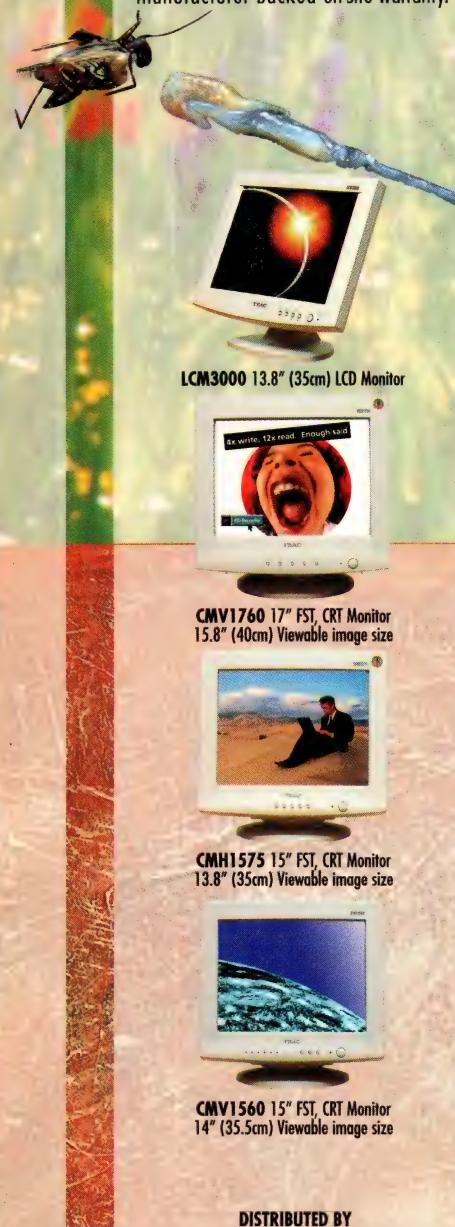
OVERALL



# whoever said size didn't matter is a liar!

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# DELL INSPIRON 3500 A366GT

## PII/366 NOTEBOOK

**VERDICT** Proving that form and function aren't mutually exclusive, the Inspiron 3500 is an impressive portable.

**PRICE** \$6,040

**SUPPLIER** Dell Computers 1300 303 148

**INTERNET** [www.dell.com.au](http://www.dell.com.au)

**AVAILABILITY** Now

**SYSTEM SPECIFICATIONS** Pentium II/366, 256Kb of secondary cache, 64Mb of SDRAM, 6.4Gb Ultra ATA hard drive, 2.5Mb NeoMagic MagicMedia 256AV graphics controller, 14.1in TFT display, NeoMagic NM3298 MagicWave 3DX sound controller, modular 4x DVD-ROM drive with hardware MPEG-2 Decoder PC Card, modular/external floppy drive, 56k Psion data/fax modem, Lithium Ion battery, Deluxe carry case, Weight: 2.7kg, 317.5 x 251 x 38mm (w x d x h), MS Works Suite 99, Windows 98.

**T**hough not quite as quick as the Gateway Solo 9100 tested last month (issue 17, p89) running on the same Pentium II/366 processor but twice the installed RAM, the Inspiron 3500 proves to be a worthy portable in its own right. Nor does Dell target the high performance market with this series – that's left to the fully-featured Inspiron 7000 line of notebooks. The 3500 rather, is marketed under the 'Maximum Mobility' banner, being thinner in profile and lighter to carry. This is achieved by designing the drives as modular units in favour of built-ins. Consequently, running the CD-ROM (or in this case DVD-ROM) and floppy drives require the latter to be connected externally via the parallel port.

It's worth noting that the base system specifications for the PII/366 model with 64Mb of RAM starts at \$5,359 – impressive for its feature list. Our review unit, fitted with the optional 4x modular DVD-ROM drive (\$486) and 6.4Gb hard disk upgrade (\$194) from the standard 4Gb, raises the asking price to \$6,040 as tested. So, unless you have a dire need to run DVD on your notebook, the

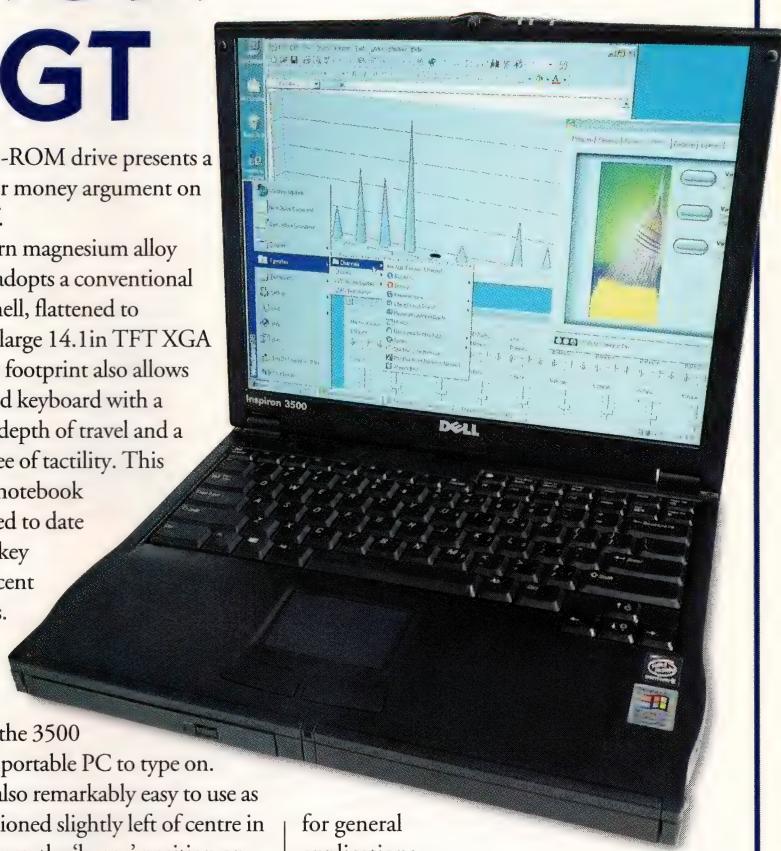
standard 24x CD-ROM drive presents a far better value for money argument on the 3500's behalf.

Bucking modern magnesium alloy trends, the 3500 adopts a conventional jet black plastic shell, flattened to accommodate its large 14.1in TFT XGA display. The large footprint also allows for a near full-sized keyboard with a surprisingly long depth of travel and a comfortable degree of tactility. This is one of the best notebook keyboards I've used to date and the italicised key labels are reminiscent of Mac keyboards.

Plenty of real estate is also devoted to the palmrest making the 3500 a very ergonomic portable PC to type on. The touchpad is also remarkably easy to use as it's correctly positioned slightly left of centre in the palmrest between the 'home' position on the keyboard. On the left hand side of the notebook dwells a PS/2 and a single USB port while the opposite end is populated by audio jacks for a mic, input and headphones along with the obligatory PC card slots. The power jack unfortunately also sits on the right hand side, which can clash if you're using an external mouse on the same side. The rear panel houses the usual array of serial, parallel, VGA, infrared and docking ports.

Both modular bays face the front and are identical in size, so the 3500 could run interchangeably with a dual battery setup in addition to CD/DVD-ROM/battery and floppy/battery combinations. The eject mechanism is a well designed and easy to use lever located on either side of the bays – a superior system to those mounted underneath the notebook. The cleverly located indicator LEDs for power, hard disk and battery/charge on the top edge of the display lid are visible even when the notebook is closed. Housed under conspicuous bulges in the case are a pair of stereo speakers which deliver adequate audio

Flat-packed and fully-featured, the Inspiron 3500 is sure to satisfy.



for general applications.

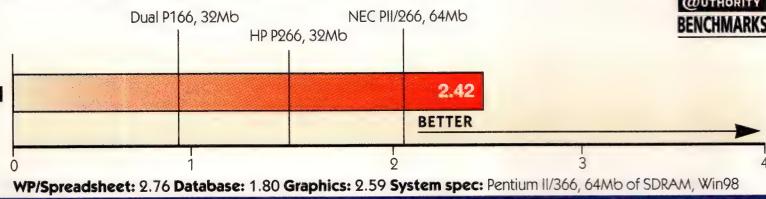
As our review unit was fitted with the optional DVD-ROM drive with the PC Card hardware MPEG-2 Decoder, DVD-to-Go player software was preinstalled allowing DVDs to be played with minimal setup or fuss. Running a DVD movie at full screen was indeed impressive; the 14.1in TFT display proved to be more than adequate for the task. Though having only 2.5Mb of memory on tap for graphics, the NeoMagic MagicMedia 256AV chipset, with an integrated audio controller, achieves a maximum resolution of 1,024 x 768 at a 24-bit colour depth. Battery performance is impressive for a notebook of this size, though the 3500 does tend to run a little hot to be used for prolonged periods on your lap.

The complete package includes Microsoft's Works Suite 99 and a nylon carry case and the 3500 is backed by a one year return to base warranty. It's not the fastest notebook on the block despite its less-than-humble configuration, but few will notice the difference. Rather, the 3500's nicely tuned ergonomics and functionality will be appreciated first and foremost. Well designed and thoughtfully engineered, the Inspiron 3500 is sure to satisfy most notebook user's needs with minimal compromises.

Simon Tsang

## Speed tests Dell Inspiron 3500 A366GT

Not the fastest, but still a great notebook.



PC @ AUTHORITY	PERFORMANCE	★★★★★
	FEATURES	★★★★★
	VALUE FOR MONEY	★★★★★
	OVERALL	★★★★★

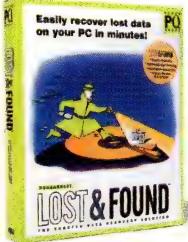


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# BROTHER HL-2060

## LASER PRINTER

**VERDICT** A good choice for workgroups at an attractive price. High resolution and good print quality compensate for over-ambitious claims of print speed.

**PRICE** \$2,440

**SUPPLIER** Brother (02) 9887 4344

**INTERNET** [www.brother.com.au](http://www.brother.com.au)

**AVAILABILITY** Now

**SYSTEM SPECIFICATIONS** 1,200 x 1,200dpi mono laser, claimed 20ppm at 600dpi, 10ppm at 1,200dpi print speeds, 100MHz Fujitsu SPARCLite processor, 16Mb of memory expandable to 72Mb, PCL6 and PostScript 2 emulations, parallel port, USB port, 150-sheet multipurpose tray, 500-sheet lower tray, drivers for Windows 3.x/95/98 and NT 4 supplied. Options: duplex unit, \$975; 500-sheet lower tray, \$609; NC-2010h Ethernet print server card with 10BaseT and 10Base2 ports, \$713.

**RUNNING COSTS** Toner cartridge, \$304. Cost per A4 page (ink only): 3.4c per page at five per cent coverage.

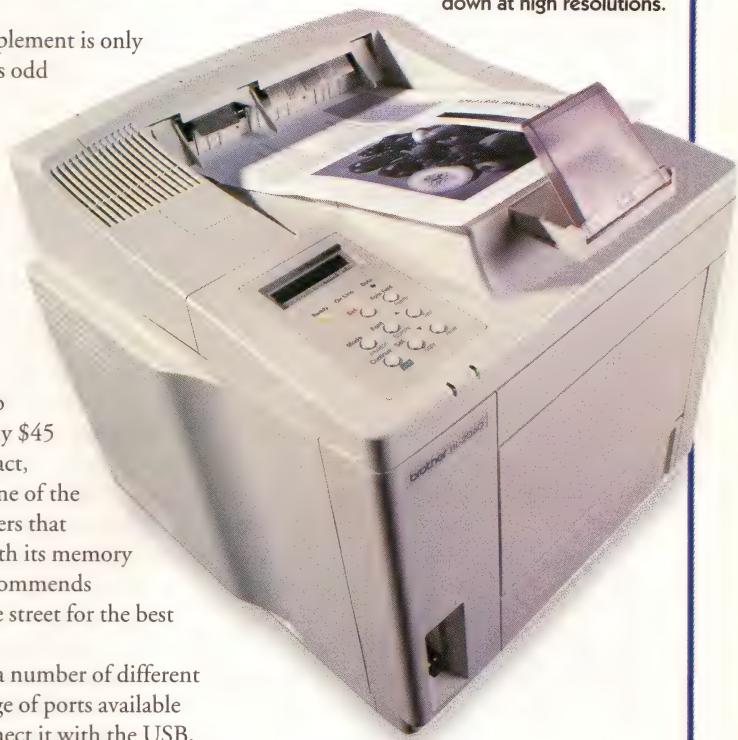
Standard memory complement is only 8Mb, however, which is odd given that the printer needs a minimum of 16Mb to print at 1,200dpi using the PostScript driver. Fortunately, the printer takes industry-standard SIMMs and can be upgraded to 72Mb. The version on review came with 16Mb installed, adding roughly \$45 to the asking price. In fact, Brother appears to be one of the few printer manufacturers that doesn't take liberties with its memory pricing and actually recommends shopping around on the street for the best upgrade bargains.

Installation can take a number of different paths thanks to the range of ports available but, if you want to connect it with the USB, Brother recommends using Windows 98 systems. You'll need to load a proprietary USB printer port driver first, but afterwards you can plug and unplug the printer at will. As with the HL-1050, the local status monitor that can be turned on from the driver panel will only work with the parallel port connection.

Network installation for the HL-2060 sees substantial improvements with the introduction of Brother's BRAdmin32 utility. This is similar to HP's JetAdmin in that it automatically searches the network for Brother print server cards and displays them in a list for easy selection. At this point you can configure NetWare bindery or NDS (Novell Directory Services) and create and assign queue objects, although you can't create users and assign printing privileges. However, the network card is fully compatible with JetAdmin and WebJetAdmin so, if you already have HP printers on your network, you'll be able to manage the lot from one interface. The card also supports TCP/IP, allowing you to access printer settings directly using a standard Web browser.

I tested the HL-2060 using a Pentium II/266 USB-equipped system with 64Mb of memory and running Windows 98. In terms of performance, I found it printed at a remarkable range of speeds depending on the resolution selected. At 600dpi, the printer delivered both text and graphics-based documents at close to the quoted speeds. But printing at the highest resolution caused it some serious problems. A 24-page Word document took 75 seconds at 600dpi for

Good print quality but slows down at high resolutions.



**A**lthough better known for its low-end mono laser solutions, Brother introduced a huge number of high-end models during 1998 and now has a comprehensive range of printers to suit every need. The latest is the HL-2060, which uses a 20ppm print engine and boasts a true resolution of 1,200dpi, although this brings the print speed down to 10ppm.

As with all of Brother's high-end lasers, the HL-2060 retains the classic cube shape. There are a few minor design changes: the front-mounted, hinged control panel has disappeared in favour of an inset panel in the top cover, which makes it easier to navigate. As well as its Type B parallel port and optional Ethernet print server card (\$713), the HL-2060 also has a USB port – a feature that's common to all the latest Brother printers.

The HL-2060 can handle paper sizes up to A4 and Legal, and comes with a 150-sheet multipurpose tray and a single lower 500-sheet cassette. Capacity can be increased with a second 500-sheet lower tray (\$609), while a duplex unit (\$975) brings double-sided printing into play. Although the HL-2060's printing costs are soundly beaten by Kyocera's workgroup printers, they're still comparatively cheap: the toner cartridge lasts for 9,000 pages at five per cent coverage, giving overall running costs of 3.4c per page.

Hidden away inside the cube-shaped casing is a controller board based on a 100MHz Fujitsu SPARCLite processor. The printer also comes with PCL6 and PostScript 2 emulation as standard.

19.2ppm, while a heavily formatted mono laser test was delivered in 85 seconds at an average of 17ppm. Adjust the settings to 1,200dpi, however, and you'll be in for a long wait; print speed took a tumble down to around 5.5ppm for both tasks. The choice of port made little difference: printing using the USB, parallel port and network card produced almost identical results for all the tests.

The print quality is good, but not good enough to make it worth waiting for 1,200dpi. As with most lasers, text is sharp enough at 600dpi but you'll be hard pushed to spot the differences at 1,200dpi. The higher resolution is primarily aimed at graphics printing but the improvements aren't that great. Even so, photographic images show high levels of detail and smooth greyscales with only minor banding to spoil the overall effect.

Surprisingly, the HL-2060 has little competition; the majority of printers offering similar speeds and higher resolutions such as HP's LaserJet 5000GN (reviewed issue 8, p85) can also handle A3-sized paper. If you don't need the latter feature you'll find the HL-2060 offers a good specification for the price, but bear in mind that the claimed print speed at 1,200dpi will be virtually unachievable with the standard 8Mb of RAM.

*Dave Mitchell*

PC @ AUTHORITY	PERFORMANCE	★★★
	FEATURES	★★★★
	VALUE FOR MONEY	★★★★
	OVERALL	★★★★

# PALM V

## PDA

**VERDICT** The Palm V somehow manages to improve on the Palm III, with a superior display and a more pleasing case.

**PRICE** \$999

**SUPPLIER** 3Com 1300 360 558

**INTERNET** [www.palm.com.au](http://www.palm.com.au)

**AVAILABILITY** Now

**SYSTEM SPECIFICATIONS** Dragonball EZ 16MHz processor, 2Mb of RAM, 2Mb of system ROM, Graffiti handwriting recognition, diary, address book, expenses, offline mail reader, memo pad, to-do list, backlit LCD, docking cradle, synchronisation software, desktop applications. Dimensions: 115 x 77 x 10mm (W x D x H). Weight: 115g.



In updating a product that was satisfactory to start with, 3Com has hardly put a foot wrong. Each successive version of the Palm has improved on the original Pilot's mix of elegant design and quick, usable software. The Windows CE handheld crowd is still playing catch-up, and the arrival of the Palm V puts it a little further behind.

The Palm V's hinged leatherette cover and metallic case give the initial impression of an old pocket calculator. Inside, though, you'll find the familiar Palm interface with the touchscreen Graffiti area and buttons to access the built-in address book, diary, to-do list and memo pad applications. In fact, on the surface you'd think that changes to the Palm had all been purely cosmetic. And while that's true to some extent, the enhancements are indeed much further than skin deep.

The newly designed case has shaved half the depth off the Palm III (reviewed issue 15, p69) which ran away with our Quality Award in the last PDA comparison, while the metallic finish helps it feel more rugged. The unit has lost its clunky air and is now more sleek and sophisticated; your shirt pocket will certainly find it easier to accommodate. The fold-over cover can be slotted in on the left or right of the case while the stylus stays on the opposite side, so for once left-handed people are well catered for. The plastic buttons have been refashioned and their surface recessed for operation with the stylus. As before, the green power button doubles as a backlight switch.

Turn the Palm V on and the first major change is immediately apparent. The display is superb. Contrast is the best we've seen and, should adjustment be necessary, a small recessed button at the top of the unit brings

up an on-screen slide-bar contrast control. The surface of the screen is less reflective than that of the Palm III, and if you place the two units side by side it's hard to understand how anyone could possibly go back to the III after the V.

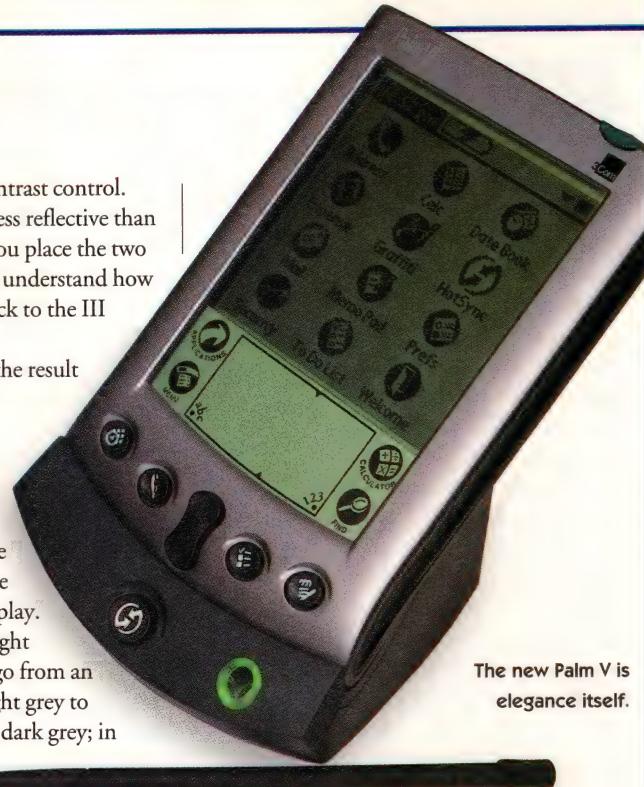
The increased contrast is the result of changing to a new screen technology, and the backlighting has been changed noticeably in the process. On the Palm III, the backlight illuminated the light grey background to give dark grey text on a green display. With the Palm V, the backlight illuminates the text, so you go from an amazingly sharp black on light grey to glowing green characters on dark grey; in backlit mode the Palm V display is therefore slightly less legible than the III's.

One mitigating factor, however, is that the new backlight could have a positive effect on battery life – with only the text illuminated, fewer on-screen pixels need to be lit.

The applications themselves remain unchanged from the Palm III, which is a shame as third-party applications such as DateBook 3 have shown how much more can be done with the diary display, for example. In line with its target audience of the less technically confident user, there is now a Welcome application to guide you through calibrating the display and other settings with clear explanations at each stage.

3Com has also upgraded the CPU from the Palm III, and this is immediately noticeable when comparing the two in a record search. Memory stays the same at 2Mb but it isn't upgradeable, unlike that of the simultaneously released Palm IIIx.

Aside from the case and display, the other main change is that the Palm V uses an internal lithium ion rechargeable battery, which accounts for the skinnier case and reduced weight. Battery life is quoted as one month of average use and, after the initial charge, 3Com claims a full charge can be achieved in just half an hour. Even in the event of a totally flat battery, enough juice is kept in reserve to retain data for a week. Charging is via the redesigned docking cradle, and the power cable takes interchangeable modules for different countries' power sockets. The power adapter has been cleverly designed to plug into the back of the 9-pin serial connector rather than directly into the cradle itself. A tidy solution that necessitates only one cable to run over your desktop. An 'inkwell' which doubles as a charge LED indicator on the cradle will house the stylus if you want to use the Palm



The new Palm V is elegance itself.

while docked, and a new Preference can be set to keep the Palm switched on while connected. These changes mean that, unlike the move from PalmPilot to Palm III, the Palm V and cradle are not compatible with earlier devices; the same applies to earlier add-ons such as modems and cables. A host of Palm V specific optional accessories have also been released in compensation including a snap-on 33.6Kbps modem for \$369.95 and a Travel Kit consisting of a compact HotSync cable and AC/DC converter/charger.

The Desktop application remains intact from the existing version 3, but the HotSync manager has been updated to include Outlook synchronisation as a standard. This uses Chapura's PilotMirror, which previously shipped with the Palm III as a separate program on the bonus CD. This synchronises your diary, address book, notes and to-do lists with Outlook and manages to keep and display Outlook's Location field on the Palm, even though it doesn't offer explicit support for it.

Power users, who may be more concerned with functionality than appearance and convenience, might wish to look at the upgraded 4Mb (expandable) version of the Palm III, the Palm IIIx which will be reviewed next month. That said, the Palm V will cater for most people's needs, and although it's a pity the software hasn't been developed much the hardware improvements are enough to keep it at the front of the pack. *Simon Tsang and Derek Cohen*

<b>EASE OF USE</b>	★★★★★
<b>FEATURES</b>	★★★★★
<b>VALUE FOR MONEY</b>	★★★★★
<b>OVERALL</b>	★★★★★

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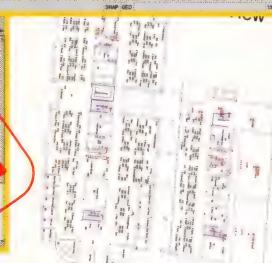
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VERSION 6 FOR WINDOWS® 95·98·NT 4.0

# ATI RAGE FURY

## 2D/3D GRAPHICS CARD

**VERDICT** Excellent performance and a top features set, the Rage Fury is currently number one in terms of 2D/3D graphics.

**PRICE** \$449

**SUPPLIER** Servex (02) 8762 3500

**INTERNET** [www.servex.com.au](http://www.servex.com.au)

**AVAILABILITY** Now

**SYSTEM SPECIFICATIONS** AGP 2D/3D graphics card, ATI Rage 128 128-bit chipset, 32Mb SDRAM, 250MHz RAMDAC, max resolution 2D and 3D 1,920 x 1,200 x 16.7M colours at 76Hz, Windows 95/98 and NT 4 drivers with OpenGL support, five year warranty; software: Expendable Lite, Half-Life Day One, Motoracer 2.



Whilst being one of the most successful graphics chip manufacturers of all time, one area where ATI has not been a strong player in the past is in the high publicity field of 3D. In response, the ATI engineers have developed a new chipset designed to compete directly with the current forerunners from 3Dfx, nVidia and S3. The resulting Rage 128 chipset has many features in common with the current 2D/3D performance leader, the nVidia Riva TNT, such as a 128-bit data bus, multi-texturing, AGP 2X and support for all the latest 3D effects like bump mapping, trilinear filtering and full scene anti-aliasing. In addition to these, it also sports some new features that are yet to appear on most competitor's chips. These features include support for a stupendous 32Mb of SDRAM on the card, a full implementation of OpenGL in both Windows 95/98 and NT, 32-bit colour without a significant performance hit and some architectural improvements. On the non-3D side of things, the Rage 128 also accelerates DVD playback, all but removing the need to include a dedicated MPEG-2

decoder in your PC.

The ATI Rage Fury with 32Mb of RAM and TV output (tested here), is targeted squarely at the performance and gaming community. With its 32Mb of RAM and a 250MHz RAMDAC, the Rage Fury can deliver a rock solid refresh rate all the way out to 1,920 x 1,200 at 16.7M colours at 76Hz. This makes it suitable for use on even the largest professional monitors.

In performance terms I tested the Rage Fury against the current reigning champion of 2D and 3D: the Asus V3400TNT based around nVidia's Riva TNT. Both cards were tested on an AOpen AX6BC motherboard with a Celeron/333 with 64Mb of RAM. In the 2D PC @uthority Benchmarks at 1,024 x 768 there is little difference between any of the current crop of 2D/3D cards, but the Rage Fury still managed to get a one per cent lead over the V3400TNT. 3D is where the cards are really pushed as far as they can go. For these tests I used Acclaim's Forsaken demo to test legacy Direct3D performance and the obligatory Quake II for all those OpenGL games based on its powerful engine. I also ran a new benchmark called 3DMark 99 Pro by Futuremark Corporation ([www.3dmark.com](http://www.3dmark.com)) which tests specific parts of the graphics chip's repertoire with an overall game oriented theme.

In Forsaken, the Rage Fury was convincingly outperformed by the V3400TNT at all resolutions and colour depths, although Forsaken does not take advantage of several of DirectX 6's new features, so this only represents 3D performance for games not written specifically for DirectX 6. In 3DMark,

Currently the fastest 2D/3D graphics card available, but for how long?

which does use the advanced features of DirectX, the Rage Fury

consistently performed 23 per cent faster than the V3400TNT at a 16-bit colour depth. When it comes to 32-bit colour, the Riva TNT chipset takes a significant performance hit, running 24 per cent slower than at 16-bit colour. The Rage Fury, on the other hand slows down only 11 per cent in 32-bit colour. This means at 1,024 x 768 at 32-bit colour the Rage Fury is running 44 per cent faster than the current top performing 2D/3D card, the V3400TNT. The only problems the Rage Fury had were with older Direct 3D games where there is a slightly static-like grain that overlays all textures. With DirectX 6 and OpenGL games, images were very clear and image quality is generally excellent.

What this amounts to is that the ATI Rage Fury is now the number one card in terms of 2D/3D performance especially in 32-bit colour. The only problem for ATI is the imminent release of the 3Dfx Voodoo3 and nVidia Riva TNT-2. Both of these chipsets will most likely outperform the Rage 128 chipset considerably, leaving ATI with but a brief moment when it was top of the heap and send it back to the less austere, but far more lucrative, consumer market again.

Tim Dean

<b>PC @UTHORITY</b>	<b>PERFORMANCE</b>	★★★★★
	<b>FEATURES</b>	★★★★★
	<b>VALUE FOR MONEY</b>	★★★★★
	<b>OVERALL</b>	★★★★★

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# PINNACLE STUDIO DC10PLUS

## VIDEO CAPTURE CARD

**VERDICT** A capable product for anyone looking for ease of use. The Studio software's preview mode makes for fast editing, but anyone requiring layered video effects should add another application or look elsewhere.

**PRICE** \$699

**SUPPLIER** Lako Vision 1800 657 601

**INTERNET** [www.lakovision.com.au](http://www.lakovision.com.au)

**AVAILABILITY** Now

**SYSTEM SPECIFICATIONS** PCI video capture card, 768 x 576 full-frame video capture, 24-bit colour, 6Mbytes/sec maximum data transfer rate, composite video and S-Video input and output, sound card required for audio capture. Software: Studio video editing and VidCap32 for video capture, drivers for Windows 95 and 98 supplied.

Photographic colour printers and digital cameras have made the PC darkroom a reality, but there's another revolution occurring on a desktop near you. PC video editing has reached a stage where it's now entirely viable on a standard Windows computer. The problem in the past has been that quality video-capture hardware has cost more than a VCR, and has competed with 3D animation and Unix in the incomprehensibility stakes. Pinnacle's Studio DC10plus is intended to offer easy video editing in an affordable package.

The DC10plus comes as a single PCI card. Installation is simple: plug it into an available PCI slot, turn on the computer and follow the prompts as Windows 95 or 98 detects the new hardware. Setting up the device drivers also initialises installation of the main editing applications. Included in the box is VidCap32 for standalone video capture, and the Studio software: an editing environment that guides you through the whole process from capture and editing, to

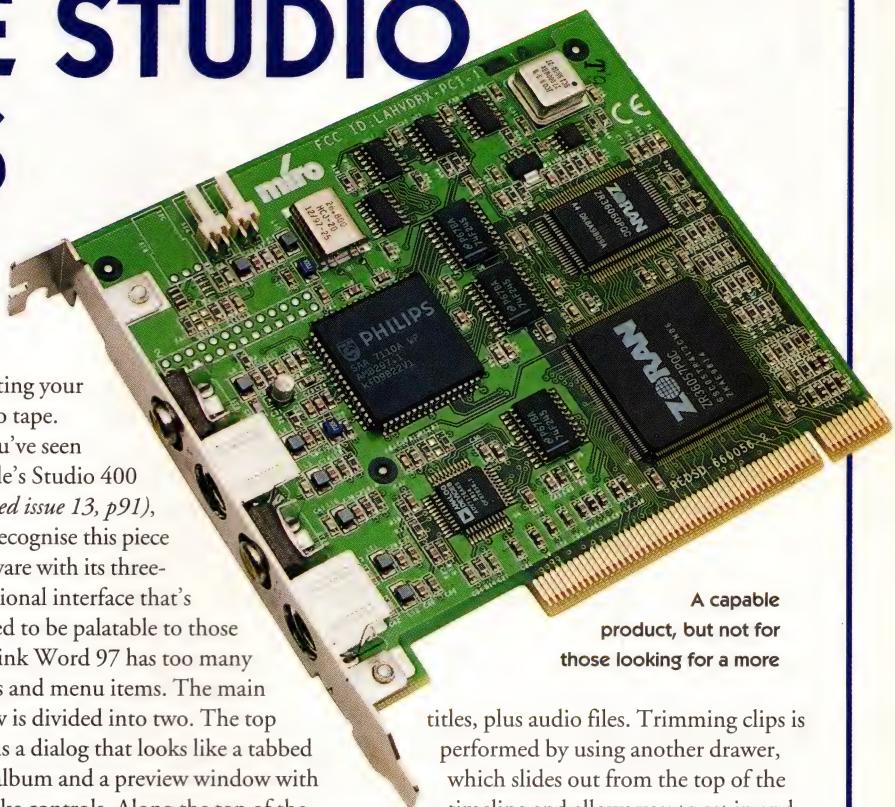
outputting your video to tape.

If you've seen Pinnacle's Studio 400 (reviewed issue 13, p91), you'll recognise this piece of software with its three-dimensional interface that's intended to be palatable to those who think Word 97 has too many buttons and menu items. The main window is divided into two. The top contains a dialog that looks like a tabbed photo album and a preview window with VCR-like controls. Along the top of the album are three tabs – Capture, Edit and Make Movie. Starting in the Capture tab, the bottom half of the application window turns into what looks like a remote control. Capture source and audio settings are hidden inside 'drawers' that slide out either side of the 'remote', but there's some useful information in the main area. A dialog tells you how much disk space you have on the chosen capture drive, and how much video that equates to at the current setting. You can change settings with simple buttons at the bottom of the control.

After choosing your settings, capture involves hitting play on your video source and record within the Studio software. The software will then detect the separate scenes on your video and create separate clip icons for each. The problem with this is that for decent quality video, the data rate will need to be around 3Mbytes/sec (in fact the card is capable of up to 6Mbytes/sec), and at this rate even a 10Gb drive will store less than an hour of video. Also, even if you're not

capturing multiple clips in one go, the detection process will still occur – it takes about as long as the original capture to do this, doubling the effective capture time.

Detected video clips are represented in the album as thumbnails. Clicking the Edit tab changes the bottom half of the application window to a storyboard or timeline depending on your View settings. You put your video together by dragging thumbnails to the timeline in the order you want. Tabs on the album provide access to a variety of 2D transitions – the excellent TitleDeko



A capable product, but not for those looking for a more

titles, plus audio files. Trimming clips is performed by using another drawer, which slides out from the top of the timeline and allows you to set in and out points. You can layer titles on top of video, and use transitions to bring them in and out; but you can't layer video on video as you can with Premiere or Media Studio. There's no way of applying video filters, either, but you can get a rough idea of your edits with an excellent full-motion preview that requires no rendering.

When it's time to output video, you can either re-compress to a file for separate distribution, or play straight back to tape. In the latter case, the effects must be rendered at full quality, but unaffected video is left alone. This makes for fast renders because it's only these areas that use up extra disk space. You can then play the video straight off the editing timeline and record it on to your VCR through the composite or S-Video outputs.

The DC10plus is a well-designed product. The software is mostly intuitive, and paves the way to hassle-free, speedy editing. High data rates are possible, and with them high-quality video too. However, if you're looking for more elaborate video editing, the Pinnacle is limited by its Studio software. You can use other software, but if you go down this route, you won't be able to play back video from the timeline, and this, in turn, limits your projects to the maximum 2Gb Video for Windows file size. Nevertheless, if your need for special effects is modest, the DC10plus is a simple and affordable entry into desktop video editing.

James Morris

PC@AUTHORITY	EASE OF USE	★★★★★
	FEATURES	★★★★★
	VALUE FOR MONEY	★★★★★
	OVERALL	★★★★★



The Studio software uses a conventional timeline for editing or a thumbnail view.

# IOMEGA ZIP 250

## ZIP DRIVE

**VERDICT** While catering for ever increasing demands for higher capacity removable storage, the Zip 250 is unfortunately let down by a lethargic transfer rate. Desperately needs a USB version.

**PRICE** \$449 (One 250Mb Zip disk included)

**SUPPLIER** Iomega (02) 9925 7700

**INTERNET** [www.iomega.com](http://www.iomega.com)

**AVAILABILITY** Now

**SYSTEM SPECIFICATIONS** 250Mb high density disk drive, parallel port interface, external power supply, quoted maximum sustained transfer rate: 0.3Mb/sec (read); 0.14Mb/sec (write), drivers for Windows 3.1x, 95/98, NT 3.51 or higher supplied. Options: 10-pack 250Mb Zip disks, \$379.

It's only been four years since the introduction of the original 100Mb Zip drive, and already Iomega is claiming 91 per cent of the SuperFloppy market, boasting over 20 million units sold and in excess of 100 million Zip disks in circulation around the world. Such widespread adoption of Zip has made it the defacto standard for removable storage media even though it's still very much a proprietary format. Little wonder then that

Iomega will do all it can to protect its little monopoly, ahem...

investment. And the new Zip 250 drive is designed to do just that, by expanding on Zip's success with two-and-a-half times the amount of storage capacity of the original Zip 100s, while maintaining backwards compatible to the existing Zip 100 disks.

The Zip 250 drive immediately looks different to its 100Mb brethren, with rounder contours and a triangular-shaped see-through window replacing the Zip 100's square-ish perspex. It borrows design queues however, from others in the Iomega range such as the embossed pattern on its topside, reminiscent of carvings found on the Jaz drive, and the eject button that doubles as a power switch, first introduced in the ZipPlus. The six, rubber-padded feet that enable the drive to sit vertically or horizontally and the recessed groove for the power cable is also a carry-over.

The Zip 250 is released in two flavours namely, parallel port for PCs and SCSI for



Bigger is better... if you need it.

both PCs and Macs. Our review unit, being of the parallel ilk, was fitted with a pass-through printer port so that other devices can still be connected when you're using the drive. But, having used the Zip USB drive (reviewed issue 17, p94), I couldn't help but feel that switching to a parallel port model again was a step backwards in both performance and ergonomics. The thick, stiff parallel cable is just one among many grievances I have with using parallel port technology in devices such as these. Another is the need to reboot your PC so that Windows can detect the Zip drive if it was switched off or disconnected.

There are no two ways about it. Parallel port is slow. And it becomes even more painfully apparent once you increase the capacity, as is evident in the Zip 250. While 0.3Mb/sec throughput was adequate for the Zip 100 drive, being significantly faster than the rival Imation SuperDisk technology, this kind of bandwidth is hardly sufficient for a 250Mb media. The SCSI version is almost a necessity (but obviously with an added cost of

# ORB 2.2GB DRIVE

## REMOVABLE STORAGE

**VERDICT** The ORB drive delivers high-performance, large capacity removable storage at a price-point unparalleled by rival devices.

**PRICE** Internal EIDE; \$399, 2.2Gb media; \$69 (1 disk supplied)

**SUPPLIER** Business Bits (02) 9279 2420

**INTERNET** [www.bbts.com.au](http://www.bbts.com.au)

**AVAILABILITY** Now

**SYSTEM SPECIFICATIONS** 2.2Gb EIDE disk drive, 25 MIPS DSP CPU, MR (Magneto-Resistive) head, quoted average seek time: 10ms read/12ms write, quoted maximum sustained data transfer rate: 12.2Mb/sec, drivers for MS-DOS 5.0 or higher, Windows 3.1x, 95/98, NT 4.0 or higher, OS/2 4.0, Mac G3 OS8 supplied.

Immediately, its specification suggests that the ORB is walking straight into Jaz territory with a 2.2Gb removable storage capacity and internal/external versions of Ultra SCSI, external parallel and internal Enhanced IDE models to complete the range. But Castlewood isn't limiting its prospects there. Official releases on the ORB clearly outlines Castlewood's intentions on taking on the entire removable storage industry including the struggling SyQuest as well as the SuperFloppies, Zip and SuperDisk, citing cost-per-megabyte and speed as its key advantages.

The main differentiation between ORB drives and its competition is its use of MR (magnetoresistive) head technology found in newer hard drives. This helps it achieve a much higher areal density than drives

based on conventional thin-film inductive heads, such as the Jaz drive. MR technology has also been credited as the main contributor to the ORB's impressive performance, a sustained maximum transfer rate of 12.2Mb/sec as opposed to Jaz's 8.7Mb/sec. The ORB media itself is lighter and thinner than a Jaz disk, with almost the same dimensions as a Zip floppy. And at a mere \$69 for a 2.2Gb media, an ORB disk works out at an incredible 3.1c per megabyte. In comparison, Iomega's equivalent

Jaz 2Gb disk costs over three times as much. The internal EIDE version reviewed here is about the size of a floppy drive. The only gripe I have with its construction is the use of 'Warranty void if removed' stickers to hold the case together rather than more solid means.

Drivers and software are supplied on the included 2.2Gb disk, and setup is run directly from the media itself. The ORB drive can be setup in one of two ways under the Windows environment. The standard is



One player emerging in the removable storage market that Iomega should be looking over its shoulders for (if it's not already) answers to the name of Castlewood Systems. The Californian-based company has developed a fast, high capacity yet low-cost removable storage solution that is as easy to use as a floppy drive.



Big on the inside.

a SCSI adapter), but an introduction of a USB incarnation would be even better. To its credit though, the Parallel Port Accelerator software, which looks at your system settings then optimises them for the Zip drive, did manage to squeeze another 15Kb/sec on average in my case.

The Zip 250 is equipped with an impressive array of software and utilities. Zip users will be familiar with the standard suite of backup, copy and restore utilities. In addition, Iomega supplies a 'RecordIt' applet that records audio and saves it directly onto the Zip disk. Norton Zip Rescue is included also for those nasty end-of-the-world PC crashes. If you're finding yourself outgrowing the 100Mb Zip disks with excessively large files, then the Zip 250 may be just the answer. It guarantees continued life for your Zip 100 disks, at the same time delivering scalability to Zip technology with a 250Mb media. On a cost-per-megabyte basis, the Zip 250 is also cheaper in the long run.

On the other hand, if you don't have special requirements for such a high capacity, the Zip USB drive is a much better bet with a higher transfer rate and a hot-pluggable interface for \$100 less.

Simon Tsang

PC @ AUTHORITY	PERFORMANCE	★★★★★
	FEATURES	★★★★★
	VALUE FOR MONEY	★★★★★
	OVERALL	★★★★★

as a removable drive, while defining it as a fixed hard disk may improve performance, but necessitates a reboot every time the media is changed.

The supplied software is an impressive suite of utilities to cater for all your backup and data recovery needs. ORB Tools handles the hardware side of things such as partitioning and formatting the disk, defect scanning and drive status/detect functions. Super Backup lets you archive entire volumes (drives) or make an image of them. For disaster recovery, the Super Backup utility creates a boot disk configured with DOS drivers for the ORB drive which automatically starts the SuperRestore application. A second Professional Backup utility lets you select individual folders through a tree-like pane that resembles Microsoft Explorer.

Although Iomega still enjoys majority market share, popularity may be less of an issue with high-end storage devices than it is with media such as the Zip or SuperDisk as they are used less for sharing large data files than for archiving and backing up within an organisation. As such, the ORB offers a very convincing argument.

Simon Tsang

PC @ AUTHORITY	PERFORMANCE	★★★★★
	FEATURES	★★★★★
	VALUE FOR MONEY	★★★★★
	OVERALL	★★★★★

# HITACHI GF-1050

## DVD-RAM DRIVE

**VERDICT** *The second DVD-RAM drive to hit the market, it has its good points but offers no great advance over the Panasonic LVD101.*

**PRICE** \$1,595

**SUPPLIER** Hitachi (02) 9888 4100

**INTERNET** [www.hitachi.com.au](http://www.hitachi.com.au)

**AVAILABILITY** Now

**SYSTEM SPECIFICATIONS** DVD-RAM drive, dual-speed DVD-ROM read, eight-speed CD-ROM read, reads DVD-RAM, DVD-ROM, CD-ROM, SCSI interface.



Hitachi makes its first foray into the DVD-RAM drive market.

**T**his is our first foray into DVD-RAM drives for Hitachi, a company that has been responsible for the best DVD-ROM drives we've seen so far. The GF-1050 drive uses a SCSI interface to connect to your PC, although the similarly specified GF-1000 is available with the standard EIDE ATAPI interface.

The GF-1050 is certainly well constructed and features a solid tray mechanism. This accepts caddy-based DVD-RAM discs as well as bare DVD-ROM and CD-ROM media. On the front fascia there's a single eject button, a media-loaded LED and an LED indicating drive activity, as well as a headphone jack and volume wheel.

DVD-RAM's biggest selling point is the price of its media – a massive 5.2Gb disc costs just \$50, making it an ideal format for file backup and data transport. Not only do the discs have more than five times the capacity of a standard Jaz disk, they're also far less prone to failure too. The discs themselves can be formatted using FAT16 or, preferably, UDF (universal disc format) since using the FAT filesystem reduces the capacity of a 2.6Gb disc to 2.3Gb.

Unfortunately, the drivers supplied are for Windows 95 and 98 only. Hitachi says an NT driver can be purchased separately, but this should really be included as standard. Once installed, I tested the drive head-to-head with the Panasonic LVD101 in a Pentium II/450 system. Writing to DVD-RAM discs saw the Hitachi writing a 90Mb file in two minutes, 40 seconds, compared to three minutes, 23 seconds on the Panasonic. However, the GF-1050 uses a delayed write technique, which can be very annoying. When a file copy is initiated it finishes instantly, while the physical data copy goes on in the background. This means the drive is still busy writing even though Windows reports

that the copy is finished. The major downside to this is that the copy can't be cancelled while in progress because Windows thinks it's already finished.

Reading the 90Mb file back revealed more closely matched results, with the Hitachi turning in a time of one minute, nine seconds, and the Panasonic creeping ahead with one minute, eight seconds. Reading a 354Mb file from a DVD-ROM disc produced identical times of two minutes, seven seconds. CD-ROM performance was a completely different matter. The Hitachi copied the 105Mb Windows 98 CABs directory in four minutes, 34 seconds, whereas the Panasonic skipped through it in two minutes, 41 seconds. In light of this, the GF-1050 might not be such an ideal replacement for a fast CD-ROM drive after all.

I had intended to test both drives with PD media as well but, strangely, the Hitachi tray mechanism refused to accept a PD disc. In a way this is understandable, as Panasonic invented the PD format and it can easily incorporate the functionality into its drive without fear of licensing problems. But it's a shame nevertheless and is another mark against the Hitachi.

As with all Hitachi DVD products, the build quality is good and, in the main, its performance is competent. Unfortunately, the Panasonic unit is more flexible and offers much better CD-ROM performance. Ultimately, the Hitachi GF-1050 is a decent unit, but Panasonic still holds the title of best removable storage device on the block.

Riyad Emeran

PC @ AUTHORITY	PERFORMANCE	★★★★★
	FEATURES	★★★★★
	VALUE FOR MONEY	★★★★★
	OVERALL	★★★★★

# CANON POWERSHOT PRO 70

## DIGITAL CAMERA

**VERDICT** *The best digital camera yet with a range of high-end features and a modicum of 'expandability'. The Pro 70 represents another big step forward for digital photography.*

**PRICE** \$2,699

**SUPPLIER** Canon (02) 9805 2000

**INTERNET** [www.canon.com.au](http://www.canon.com.au)

**AVAILABILITY** Now

**SYSTEM SPECIFICATIONS** 1.68 million pixel CCD,  $1,536 \times 1,024$  maximum image resolution, 24-bit colour depth, 2.5x optical zoom (6-15mm), sensitivity ISO 100-400, 15Mb CompactFlash card (holding up to seven CCD raw or 39 high-res JPEG images), two CompactFlash card slots, 2.5in TFT LCD, rechargeable NiMH battery pack with charger, mains adaptor, PhotoImpact 4, bundled software, drivers for Windows 95 and 98 supplied. Options: PC Card reader and 4Mb CompactFlash card, \$249; semi-hard case, \$99; hand strap, \$75. Weight: 810g.



You only have to look in your local newsagent to see that digital photography is here to stay. The number of digital photography publications is

burgeoning, and the advent of mega-pixel cameras and affordable, photographic-capable colour printers, means that if you're willing to shell out the requisite cash you can shoot and reproduce photographs very close in quality to traditional film-based cameras.

It will be a while before digital cameras become as ubiquitous as their 35mm counterparts, but it will happen eventually. Canon's PowerShot Pro 70, like the Minolta Dimâge EX 1500 Zoom (reviewed issue 17, p75), brings it another step closer. This isn't down to a quantum leap in technology, but rather a difference in attitude. Unlike the majority of its digital camera siblings, the Pro 70 hasn't been designed as a compact, but instead imitates higher-end SLRs such as Canon's EOS in a bid to appeal to more serious photographers.

It's a role it takes very seriously. When I first removed the Pro 70 from its box, I was taken aback at how heavy and solidly built it felt. Most compact digital cameras tend to veer towards the plasticky side – for example, the

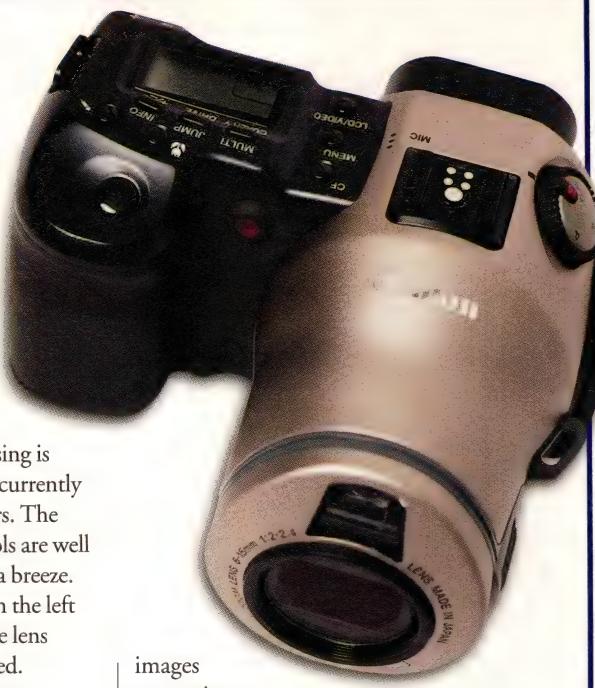
Hefty but capable of high-quality images.

Olympus C-900 Zoom – but the Pro 70 gives the impression of real quality, aided by the fact that the casing is mostly magnesium alloy, a material currently favoured by notebook manufacturers. The ergonomics and layout of the controls are well thought out too, making operation a breeze. The placing of the zoom control – in the left thumb position on the outside of the lens housing – is particularly well designed.

Surprisingly for a camera of these aspirations, the Pro 70 features a standard rather than a SLR (single lens reflex) viewfinder. So if you really want to see exactly what you're shooting you need to use the LCD. This is hidden on the rear of a hinged flap that has to be folded out, rotated and then folded back into place. A bit of a hassle you might think, but this method offers two advantages over a fixed screen. First, the screen is protected when not in use and, second, it can be flexibly positioned so you can take a self-portrait or hold the camera above your head while still retaining control over the framing of your shot.

Another area where the Pro 70 diverges from the compact camera norm is the flash: it doesn't have one. Instead, you get a hot shoe connector on top on the unit for connecting professional flash guns; Canon recommends its own, of course, the cheapest of which is \$229. For delicate tripod work, you'll find a socket for connecting a remote shutter switch under a rubber flap on the side together with all of the output connections. And again, unlike any other digital camera we've seen, the Pro 70 allows you to fit standard 37mm filters.

In terms of raw specifications, the Canon is right up there with the best. In fact, it even looks slightly better on paper than the excellent Minolta reviewed last month. The Pro 70 features a very high-resolution 1.68 million pixel CCD (charge coupled device) which produces images  $1,536 \times 1,024$  in size in 24-bit colour – the highest resolution digital camera we've seen yet. The zoom lens can't quite match the range of the Minolta's – 28-70mm in 35mm camera terms compared to 38-115mm – but it does have a much lower wide-angle setting. Images can be saved onto the supplied 15Mb CompactFlash card as JPEGs in one of four different quality settings or, for the highest quality, as uncompressed CCD raw



images

occupying roughly 2 to 2.5Mb per image. If you're going to be using this mode a lot, however, it's worth investing in a CompactFlash card reader because the transfer takes well over a minute per image via the camera's serial link.

Image quality on the latter setting is stunning. Even when compared directly to the Minolta Dimâge EX 1500 Zoom – which is superior to its rivals – the Pro 70 is noticeably superior. Object edges are smoother and more crisply rendered, and detail capture in dark areas is particularly impressive. The build quality and design aspirations are well and truly reflected by the image quality demonstrated by this impressive camera.

Beyond the camera itself, there's a decent accessory bundle as well. As with other Canon cameras before it, the Pro 70 features a rechargeable battery and charger, but the battery compartment also takes standard 2CR5 lithium batteries should you find yourself without access to a power point. For those who haven't already invested in a decent image-editing application, there's a full copy of Ulead's excellent PhotoImpact 4 and a handy but bizarre image browsing utility that arranges images by date along the sides of a scrolling 3D tunnel.

Although digital photography has yet to take over, cameras like the Pro 70 can only make the sceptics sit up and take notice. It may well be superseded in a matter of months, but for now its unparalleled image quality and high-end features coupled with solid design make it the best digital camera around.

*Jonathan Bray*

PC @UTHORITY	PERFORMANCE	★★★★★
	FEATURES	★★★★★
	VALUE FOR MONEY	★★★★★
	OVERALL	★★★★★

# SURVEY MAY 1999

*PC @uthority* will donate \$1 per entry form received to the most highly named charity in the last question on this survey. *PC @uthority* strives to bring you a magazine with no equal in both editorial excellence and value for money. *PC @uthority* exists because of you and for you – and we continue to require your assistance. Please take five minutes of your valuable time to fill out this Reader Survey. The information you give us enables us to keep a finger on the pulse of what you, the reader, want. Your answers directly impact the style and the content of the magazine, so please let us know how we can do better. Plus win 10 free subscriptions to *PC @uthority*, Tech Support and browser! So don't delay and send your survey form in now! Congratulations to our previous survey winners; we made a donation of \$600 to the Salvation Army.



## ABOUT YOUR PC AT WORK

### 1. Do you use a PC at work?

NO  YES

### 2. Which operating system do you use on it?

<input type="checkbox"/> Windows for workgroups	<input type="checkbox"/> Windows 95/98
<input type="checkbox"/> Linux	<input type="checkbox"/> Windows NT 4.0
<input type="checkbox"/> OS2	<input type="checkbox"/> UNIX

### 3. What processor is it based on?

### 4. How much memory does it have?

Mb

### 5. How big is its hard disk capacity?

Gb/Mb

### 6. What additional devices do you own/use? (H) Home OR (W) Work

H	W	H	W
<input type="checkbox"/> 17in monitor	<input type="checkbox"/> 19in monitor	<input type="checkbox"/> 21in monitor	
<input type="checkbox"/> Back up device	<input type="checkbox"/> CDWriter	<input type="checkbox"/> Sound Card	
<input type="checkbox"/> Digital Camera	<input type="checkbox"/> DVD Drive	<input type="checkbox"/> Inkjet printer	
<input type="checkbox"/> Laser printer	<input type="checkbox"/> Notebook	<input type="checkbox"/> Modem	
<input type="checkbox"/> ISDN	<input type="checkbox"/> Scanner	<input type="checkbox"/> Video Camera	
<input type="checkbox"/> Video capture.	<input type="checkbox"/> 3D graphics acc.	<input type="checkbox"/> Laser printer	

### 7. What devices do you plan to buy in the next 12 months?

H	W	H	W
<input type="checkbox"/> 17in monitor	<input type="checkbox"/> 19in monitor	<input type="checkbox"/> 21in monitor	
<input type="checkbox"/> Back up device	<input type="checkbox"/> CDWriter	<input type="checkbox"/> Laser printer	
<input type="checkbox"/> Digital Camera	<input type="checkbox"/> DVD Drive	<input type="checkbox"/> Inkjet printer	
<input type="checkbox"/> Laser printer	<input type="checkbox"/> Modem	<input type="checkbox"/> Video Camera	
<input type="checkbox"/> Notebook	<input type="checkbox"/> Scanner	<input type="checkbox"/> Sound Card	
<input type="checkbox"/> Video capture	<input type="checkbox"/> 3D graphics acc.	<input type="checkbox"/> ISDN	

## ABOUT YOUR PC AT HOME

### 8. Do you use a PC at home?

NO  YES

### 9. What operating system do you use on it?

<input type="checkbox"/> Windows 95	<input type="checkbox"/> Windows NT 3.51
<input type="checkbox"/> Windows NT 4.0	<input type="checkbox"/> UNIX
<input type="checkbox"/> OS2	<input type="checkbox"/> Linux

### 10. What processor is it based on?

### 11. How much memory does it have?

Mb

### 12. How big is its hard disk capacity?

Gb/Mb

## OTHER COMPUTING DEVICES

### Notebooks

### 13. Which option best describes your notebook usage?

Never use a notebook  Borrow one when I need one  
 Have a company one for my exclusive use  
 Own my own

### Personal Digital Assistants (PDAs)

### 14. What PDA if any do you use?

Cassiopeia  HP  Sharp  
 Apple Newton  Windows CE Based PDA  
 Palm Pilot  Psion

## ACTIVITIES

### 15. Prioritise your time spent on these areas (1 being top priority):

Word processing	<input type="checkbox"/>
Spreadsheets	<input type="checkbox"/>
Online publishing/Web design	<input type="checkbox"/>
Graphical design/DTP	<input type="checkbox"/>
Presentation graphics	<input type="checkbox"/>
Online browsing/email	<input type="checkbox"/>
Multimedia authoring	<input type="checkbox"/>
Desktop video editing	<input type="checkbox"/>
Designing databases	<input type="checkbox"/>
Program development	<input type="checkbox"/>
Engineering/Scientific	<input type="checkbox"/>
Playing Games	<input type="checkbox"/>

### 16. What percentage of your computing takes place at work?

%

### 17. Do you currently have access to email and the World Wide Web?

NO  YES

### 18. If YES- Do you connect to the Internet mainly through:

ISDN  Leased line  Modem dial up

### 19. If NO- How likely is it that you will get Internet access within the next 12 months?

Unlikely  Possible  Possible

**20. Why would you choose one ISP over another?**

Technology       Security       Service  
 Modem ratios       Bandwidth       Brand  
 Cheapest       Proprietary content       Connections  
 Number of existing subscribers  
 Other: \_\_\_\_\_

**RECEIVING PC @UTHORITY****21. Are you a subscriber?**

NO       YES

If YES (Subscriber),

**22. Will you be renewing your subscription?**

NO       YES

**23. How satisfied are you with the delivery of PC @uthority?**

Very Unsatisfied       Unsatisfied  
 Satisfied       Very Satisfied

**24. Have you needed to call PC @uthority Subscriptions in the past?**

NO       YES

**25. If you have called the PC @uthority subscriptions department, was your problem/requirement dealt with satisfactorily?**

NO       YES

If NO (Non-Subscriber),

**26. Will you be subscribing?**

NO       YES

**27. If NO-Will you continue to buy it from the newsagents?**

NO       YES

**28. In a given month, do you buy the magazine for:**

Adverts to check prices and suppliers       Cover CD  
 Product review prior to a purchase       Cover Features  
 Keeping up to date with new products/technologies  
 Other: \_\_\_\_\_

**PC @UTHORITY READING HABITS****29. Which part of the magazine do you read first?**

Adverts       Competition       Opinion columns  
 Connexions       Features       Horizons  
 Labs       Reviews       Letters

**30. How many of the past six issues have you read?**

0-1       2       3  
 4       5       6

**31. What percentage of an issue do you read?**

25%       50%       75%  
 All

**32. Do you keep back issues for reference?**

NO       YES

**33. Do you keep back Cover CDs for reference?**

NO       YES

**ADVERTS****34. How often do you use of the adverts in PC @uthority?**

Never       Some months  
 Most months       Every month

**35. How often do you make or change a buying decision based on the adverts in PC @uthority?**

Never       Some months  
 Most months       Every month

**COVERMOUNTS****36. How do you rate PC @uthority's cover discs?**

Not as good as the other magazines  
 Better than other magazines

**37. In how many of the past six months have you used PC @uthority's Cd to install or upgrade a utility?**

0       1       2       3       4       5       6

**38. In how many of the past 6 months did you run the games from the Cover Disc?**

0       1       2       3       4       5       6

**39. Which of these types of products would you want more of and which would you be happy to have less of?**

Games       Full versions of software  
 Limited versions of new software  
 Essential shareware, utilities and drivers  
 Walk throughs and tutorials of leading software packages

**OPINION COLUMNS****40. How often do you read?**

	Never	Often	Always
The editor's Logon column	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dick Pountain's Idealog column	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Jon Honeyball's Epilog column	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
James Morris' Technolog column	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Horizons Opinion column	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The opinion at the start of reviews	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**News - Horizons****41. For each of the Horizons categories below, what do you think about the number of stories we carry each month?**

	Too few	About right	Too many
Futures and technology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Government policy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hardware	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
In brief stories	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Industry news and trends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Networking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
New products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Software	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Training/ Careers/ IT Professions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
News Analysis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**FEATURES****42. What do you think about the number of features that we carry on the following topics?**

	Too few	About right	Too many
Business Issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Future Technologies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Masterclass/productivity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Networking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**43. How many of the features do you read each month?**

All       Most       Some       None

**LABS****44. How often do you read at least one of the Labs reports?**

Never       Always       Sometimes

**45. Should PC @uthority Labs do reports on software?**

Yes       Indifferent       No

**46. Have you made or changed a buying decision based on the findings of a Labs report?**

NO       YES

**47. Have you in the past six months bought one of the products reviewed in PC @uthority Labs?**

NO       YES

**Buying advice/Information****48. Have you bought products as a result of their being included in PC @uthority's A list?**

NO       YES

## INDIVIDUAL REVIEWS

### 49. How many of the reviews do you read?

None  A Few  Less than half  More than half

### When and why do you read the review section?

Never  When about to buy a product  
 For own interest  Too keep up in touch with new products  
**50. PC @uthority has started running previews of products based on pre-release samples. How useful do you find these?**  
 Not Useful  Useful

### 51. Are there categories of products that we're not reviewing that we should start to include?

### 52. Have you made or changed a buying decision because of a review?

NO  YES

## REAL WORLD COMPUTING

### 53. How often do you read the following sections:

	Never	Often	Always
Advanced Windows	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Applications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Back Office	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Multimedia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Networks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PDAs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Publishing Graphics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Technical Support	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unix/Java	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visual Programming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Web Business	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Games

### 54. How often do you play games on your PC?

Never  Once/twice a month  
 Once/twice a week  Every day

### 55. How often do you play online games?

Never  Once/twice a month  
 Once/twice a week  Every day

## MAGAZINES

### 56. How many issues of these magazines have you read in the past three months?

	None	Some	All
PC World	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Australian Personal Computer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PC World	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PC Week	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Communiqué	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PC Powerplay	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PC User	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PC Buyer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
browser (second issue out now)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other Internet publication	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## ABOUT YOU

### 57. Your age group

Under 18  18-24  25-34  
 35-44  45-54  55-64  65+

### 58. Annual Salary

Under \$18,000  \$19-30,000  \$31-45,000  
 \$46-60,000  \$61-80,000  Over \$80,000

### 59. Job Title

Chairman/owner/partner  Managing/Finance Director

<input type="checkbox"/> IT/MIS/DP Manager/Director	<input type="checkbox"/> Other Director
<input type="checkbox"/> Finance Manager/Accountant	<input type="checkbox"/> Sales/Marketing Manager
<input type="checkbox"/> Department or other manager	<input type="checkbox"/> Lawyer/Doctor/ Professional
<input type="checkbox"/> Engineer/scientists	<input type="checkbox"/> Executive
<input type="checkbox"/> Programs/Systems professional	<input type="checkbox"/> Computer Consultant
<input type="checkbox"/> Design/Artists	<input type="checkbox"/> Teacher/Lecturer
<input type="checkbox"/> Other	

### 60. Your responsibility for purchasing a product:

Specify products   
 Order products   
 Specify Suppliers   
 Make suggestions for product/supplier   
 No involvement

### 61. Working at Home

If you are in full or part time employment or self employed, what percentage of the working week do you work at home?

%

## ABOUT YOUR COMPANY

### 62. Annual budget for computer products

<input type="checkbox"/> Don't Know	<input type="checkbox"/> Under \$1,000	<input type="checkbox"/> \$1,001-\$5,000
<input type="checkbox"/> \$5,001-\$10,000	<input type="checkbox"/> \$10,001-\$15,000	<input type="checkbox"/> \$15,001-\$25,000
<input type="checkbox"/> \$25,001-\$50,000	<input type="checkbox"/> Over \$50,000	

### Primary Business

Manufacturing <input type="checkbox"/>	Computer manuf.(hardware/software) <input type="checkbox"/>
Govt./Public Service <input type="checkbox"/>	Trade (wholesale/retail) <input type="checkbox"/>
Banking/insurance/finance <input type="checkbox"/>	Computer trade (dealer/VAR) <input type="checkbox"/>
Construction <input type="checkbox"/>	Transport/communications <input type="checkbox"/>
Education <input type="checkbox"/>	Distribution <input type="checkbox"/>
Manufacturing <input type="checkbox"/>	Health care <input type="checkbox"/>
Mineral/chemical/oil <input type="checkbox"/>	Other service <input type="checkbox"/>
Food/agriculture <input type="checkbox"/>	Media/publishing/design <input type="checkbox"/>
Transport/communications <input type="checkbox"/>	Other (please specify) <input type="checkbox"/>

### Number of employees

1-10  11-25  25-100  100+

## Name the charity of your choice

Thank you for completing this survey, entries must be received before May 20th 1999 to be eligible for the prize draw. Send completed entries to the address below:

PC @uthority Reader Survey, PO Box 275,  
 647 Botany Road, Beaconsfield 2014.

## Reply Form

Email \_\_\_\_\_

Name \_\_\_\_\_

Company \_\_\_\_\_

Position \_\_\_\_\_

Address \_\_\_\_\_

Post Code \_\_\_\_\_

Telephone \_\_\_\_\_

# DREAMWEAVER 2

## HTML AUTHORIZING

**VERDICT** With a host of improvements over the previous version, Dreamweaver 2 is still the best solution around for serious site development, providing the perfect balance between design and productivity.

**PRICE** full: \$569; upgrade: \$235

**SUPPLIER** Firmware (02) 4721 7211

**INTERNET** [www.macromedia.com/ap](http://www.macromedia.com/ap)

**AVAILABILITY** Now

**SYSTEM REQUIREMENTS** Pentium/90, 32Mb of RAM, 20Mb of hard disk space, Windows 95/98 or NT 4.



As far as wysiwyg Web authoring packages go, Dreamweaver has had this niche pretty much sewn up since its launch back in the early part of 1998 (reviewed issue 6, p100). It was one of the first packages to seriously implement and focus on the then new Dynamic HTML and cascading style sheets (CSS) standards, and also to capitalise on the ability to position page elements precisely where you wanted them.

Although it embraced new technologies, Dreamweaver didn't neglect the tools essential for painless site creation and maintenance. In short, if you could afford it, the original incarnation of Dreamweaver was

the best and most up-to-date visual authoring package around, giving you control over the complexity and format of your code.

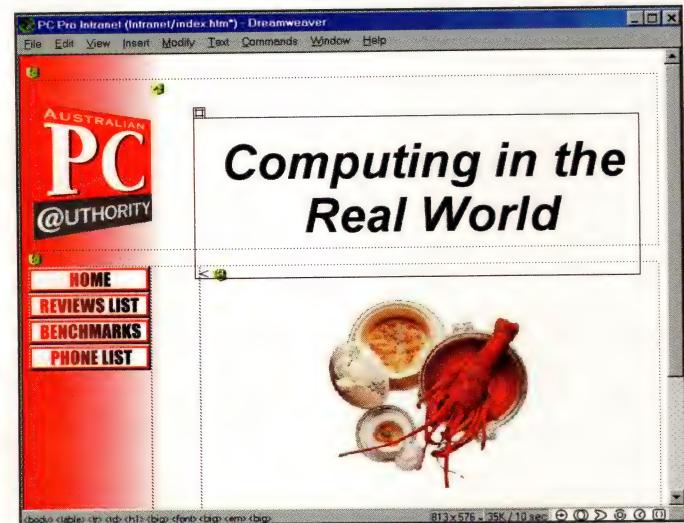
A year later, it's now time for Dreamweaver 2 to make its mark. At first glance, it all looks very familiar, and closer examination confirms that this latest incarnation hasn't seen any overly dramatic changes. Instead, Dreamweaver 2 represents more of a consolidation, with plenty of small yet effective tweaks and additions to what was already a good product.

### What's new?

One of the few areas singled out for criticism last time round was Dreamweaver's comparative lack of site management tools, especially when often these tools could be found in lesser packages. In response, Macromedia has provided a visual representation of site structure as well as global find and replace tools. The new visual map tool isn't up to the standard set by HoTMetal Pro 5's cyber site tree view, but it does have some useful facilities up its sleeve. At the most basic level, it allows you to see the structure of your site quickly, together with

all the individual page links on each page. You can select and edit each link individually from the site view module or go into the page it's on to take a look. There's also a dragable pointer which can be used to add links, although this is of dubious worth. On the down side, the site map becomes really cramped when a page has a lot of links and linked items and there isn't any way of properly tracking JavaScript links.

More useful is Dreamweaver 2's ability to perform complex search operations. This is an area that has been neglected by a number of packages for much too long, instead being content to provide a simple text find and replace tool that looks for a simple text string

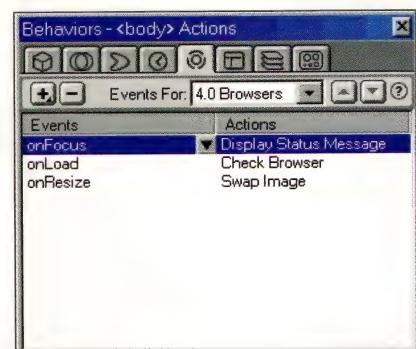


Dreamweaver's minimalist main working area may look uncluttered, but wait until you see the mountain of palettes.

within a document. While this approach is fine for word processors, HTML demands something a little more flexible. Hence Dreamweaver's HTML-aware tool, which allows you to search for tags that meet certain criteria – an `<IMG>` tag that has its SRC property set to TEST.GIF, for example – and change attributes or delete them. The HTML source search also allows you to specify strings that will be found in the HTML code, while an advanced text search

lets you look for strings of text inside or outside HTML tags. Compared to the first version, there's considerably more power on tap.

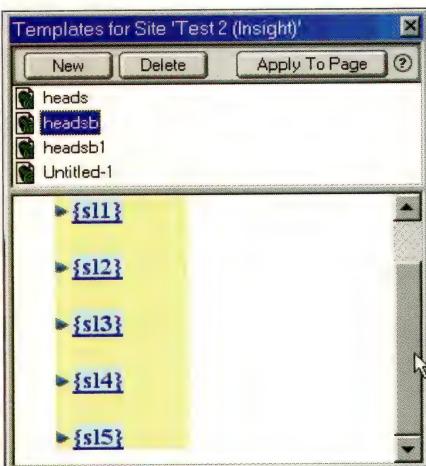
A further concession to manageability and productivity is Dreamweaver's ability to use templates. You can now set up straightforward templates, so regulating the appearance of each



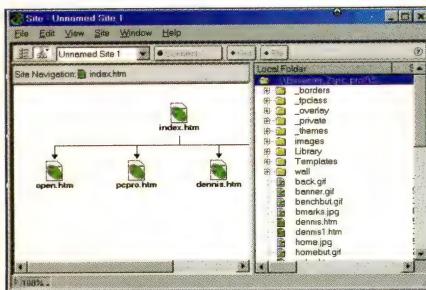
The list of preprogrammed JavaScripts now includes a handy browser detection routine.

page is a simple task. You can also 'lock' various page elements so that less experienced team members can safely add or edit content without fear of accidentally altering essential design elements such as table cell widths or headers and footers. The system is similar to fields in Microsoft Word.

Perhaps the most exciting new feature is the ability to convert a layout that's been created with Dreamweaver's Quark-style layers to invisible tables. This may sound innocuous to the uninitiated, but it enables the easy creation of exacting layouts that will look exactly the same in earlier and non-mainstream browsers as it does on the latest browsers. Indeed, the only other Web



The new templates feature lets you 'lock down' certain page elements to make them uneditable.



Not the most aesthetic of site views – the new search facilities are far more useful.

authoring package that can stretch to such a feat is NetObjects Fusion. Together with Dreamweaver's browser detection routine, it's also possible to create two versions of complex pages, one for pre-absolute positioning browsers, and another for the latest generation, ensuring maximum compatibility.

To help in the initial page layout process, Macromedia has included another feature that's primarily aimed at designers. Basically, a feature known as the tracing layer allows you to insert a pre-designed graphic in the background as a guide to layout. Essentially, this means that your art department can use a graphics package such as Photoshop for all the creative design work, which can then be used as a template for laying out the actual Web pages. In short, you can capitalise on the creative talent already available in your organisation without having to kit people out with new software or teach them a whole new skill set.

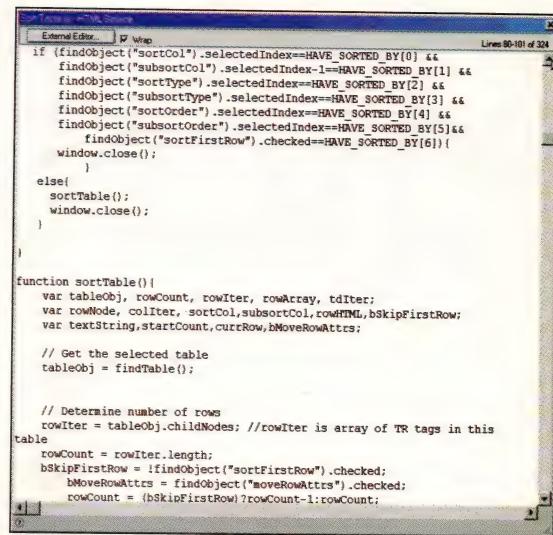
## Refinements

But the secret to successful product development shouldn't hinge on fancy new tools and features. Refinements and small improvements are just as important, and Dreamweaver scores extremely well on this count. The most immediate alteration can be seen in the composition and layout of the various Photoshop-style palettes that littered the Dreamweaver workspace. Previously, with all the palettes visible the screen soon became unbearably cluttered, even when using a large monitor. This problem was exacerbated by the fact that a new window appeared every time you loaded a new document. In an attempt to tidy things up, there are now customisable tabbed dialog boxes whereby you can dock all or just a selection of the palettes together in one neat box. However, the multiple windows problem does unfortunately remain a thorn in Dreamweaver's side.

The only windows that cannot be combined in this way are the property inspector, which provides instant dynamic access to the properties of selected page elements, and the HTML code-editing window. Both of these have been upgraded in other areas, though. The property inspector crams in more features in terms of page elements, and throws in a couple of universal extras for good measure too. An eye-dropper tool lets you pick a colour on screen and then automatically selects the closest 'Web-safe' hex value for you, while a dragable pointer allows you to create hyperlinks by simply pointing at an HTML file.

Moving over to the behaviours palette reveals a number of useful additions and improvements, notably the aforementioned browser detection script. Embedding this particular script, or 'behaviour', in a page will allow you to redirect any user's browser to different pages based on the browser being used. The method for producing image roll-overs is now a far less laborious process, and those rather frivolous Dynamic HTML animations are also far easier to create: simply drag a layer around the screen freehand and Dreamweaver will trace the path and reproduce it in animation.

If a lot of your work involves tables, you'll be glad to hear Dreamweaver's table-editing functions have also received the spit-and-polish treatment. Although among the best in the business, the original Dreamweaver was annoyingly restrictive in that it wouldn't allow the selection of multiple



```

if (findObject("sortCol").selectedIndex==HAVE_SORTED_BY[0] &&
    findObject("sortCol1").selectedIndex==HAVE_SORTED_BY[1] &&
    findObject("sortType").selectedIndex==HAVE_SORTED_BY[2] &&
    findObject("sortSubType").selectedIndex==HAVE_SORTED_BY[3] &&
    findObject("sortOrder").selectedIndex==HAVE_SORTED_BY[4] &&
    findObject("sortSubOrder").selectedIndex==HAVE_SORTED_BY[5] &&
    findObject("sortFirstRow").checked==HAVE_SORTED_BY[6]){
    window.close();
}
else{
    sortTable();
    window.close();
}

function sortTable(){
    var tableObj, rowCount, rowIter, rowArray, tdIter;
    var rowNode, colIter, sortCol, subSortCol, rowHTML, bSkipFirstRow;
    var textString, startCount, currRow, bMoveRowAttrs;
    // Get the selected table
    tableObj = findTable();

    // Determine number of rows
    rowIter = tableObj.childNodes; // rowIter is array of TR tags in this table
    rowCount = rowIter.length;
    bSkipFirstRow = !findObject("sortFirstRow").checked;
    bMoveRowAttrs = findObject("moveRowAttrs").checked;
    rowCount = (bSkipFirstRow)?rowCount-1:rowCount;
}

```

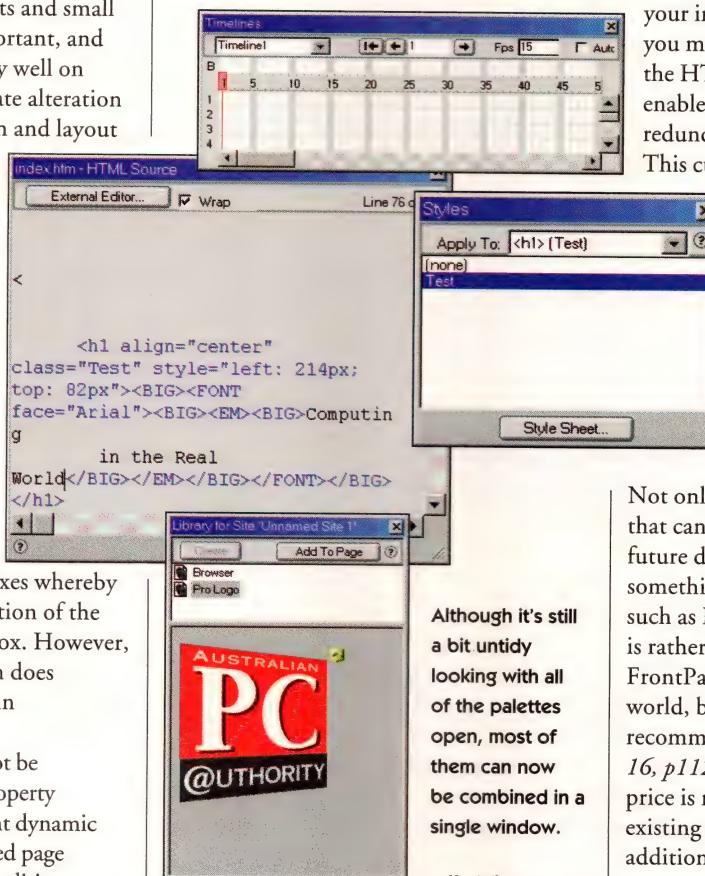
You can now add customised JavaScript commands to menus. This is what the Table Sort command looks like.

further into how it works. It turns out that all of the commands found on the Commands menu are written in JavaScript, which in turn means that it's possible to create your own JavaScript and tailor it to your individual way of working. To give you more of an idea of the potential here, the HTML clean-up command, which enables you to remove nested and redundant tags, is written in the same way. This customisable philosophy is extended

to other areas: the tag database, for instance, allows you to define your own proprietary tags. In theory, Dreamweaver should be future-proof.

Add this to the fact that Dreamweaver parses XML documents and you have an extremely powerful, flexible Web authoring system.

Not only that, but you also have something that can be built upon and that's open to future developments – which isn't something that can be said of a product such as FrontPage. At \$569, Dreamweaver is rather more expensive than the FrontPages and HoTMetal Pros of this world, but with the *PC @uthority* recommended HomeSite 4 (reviewed issue 16, p112) as an added bonus, the asking price is more than justified. If you're an existing user, the improvements and additions, many and useful though they are, may not be enough to persuade you to upgrade. But if you're dipping your toe in the water for the first time and want a serious, no-nonsense wysiwyg Web-authoring system, nothing comes close to Dreamweaver 2.



Although it's still a bit untidy looking with all of the palettes open, most of them can now be combined in a single window.

cells. This version remedies the problem and even allows the selection of discontinuous cells that can then be subsequently pasted into the table elsewhere. It's an incredibly flexible system that's rendered even more powerful by the table sort tool: this resides in the Commands menu and allows you to re-order rows and columns as you would in Excel.

The table command is more interesting, however, if you take the time to delve

<b>EASE OF USE</b>	★★★★★
<b>FEATURES</b>	★★★★★
<b>VALUE FOR MONEY</b>	★★★★★
<b>OVERALL</b>	★★★★★

# DIRECTOR 7 SHOCKWAVE INTERNET STUDIO

Here, Director is tweening the second 'n' from white to red in the rather cluttered interface.

## MULTIMEDIA AUTHING

**VERDICT** This new version of the most popular authoring tool ups the user-friendly ante and is now even better for interactive Web development.

**PRICE** \$1,895; upgrade from Director 6.5, \$795

**SUPPLIER** Firmware (02) 4721 7211

**INTERNET** [www.macromedia.com/ap](http://www.macromedia.com/ap)

**AVAILABILITY** Now

**SYSTEM REQUIREMENTS** Pentium/233 MMX, 32Mb of RAM, 100Mb of hard disk space, 17in display.

Almost since its inception, Director has been the most popular authoring tool on the market. That's not to say it's the best, but it was one of the first to appear and it's also available in both PC and Mac versions for cross-platform development. This has resulted in an enormous following, which has expanded even further with the pre-eminence of the ShockWave format and Director as a Web development tool.

But that doesn't necessarily mean that it's perfect, or even nearly perfect, and previous versions have caused me some doubt. Director's strengths have always revolved around the quality of its visual effects but, with the incorporation of DirectX into rivals such as Dazzler Deluxe and Scala MM200, Director movies are now beginning to look dated. Version 7 is a definite attempt to redress the balance and, up to a point, it succeeds.

As its name suggests, Director adopts the metaphor of film-making. A Director presentation is known as a Movie and the run-time player which allows your audience to view the presentation is called a Projector. The screen is the Stage, the graphics, sounds and text that appear in the Movie are the Cast, and the timeline used to co-ordinate the Cast is known as the Score.

To create a new Movie, you import resources to become Cast Members. Cast Members are then dragged onto the Stage, where they become Sprites. These are separate from the Cast Members they're derived from: a single Cast Member could be

represented on screen by a number of Sprites in the same way that a single actor may appear several times in a film.

Director is based around a timeline, along which a playback head travels. A Sprite appears on both the Stage and the Score. On the Score, it's represented by a line that indicates in which frames it's visible.

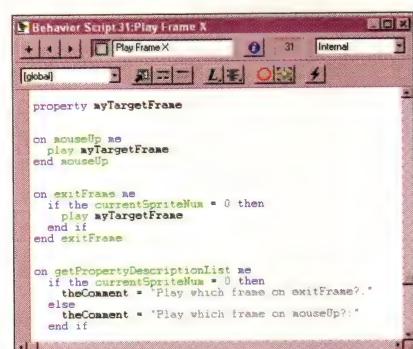
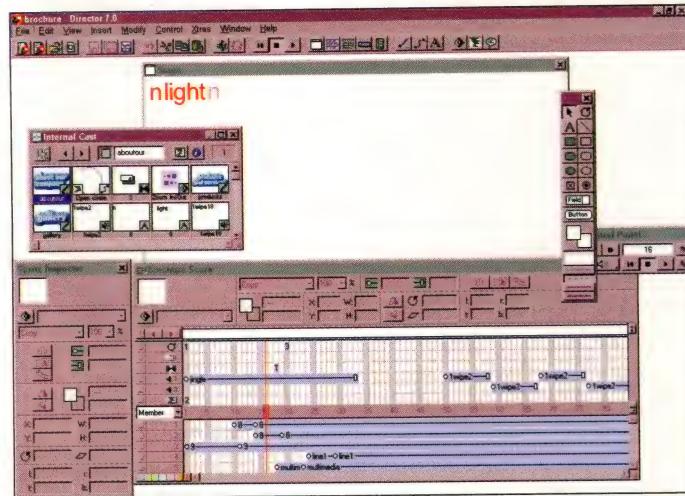
As an example, imagine I'm creating a CD-ROM and Internet-based brochure to send to prospective clients. First, I want the company name to appear, and to do this I create a text Cast Member containing the name. I move the playback head to the first frame in which I want the text to appear, and then drag the Cast Member onto the Stage to create a Sprite. I could reuse this Cast Member as many times as I like without affecting the Sprite I've just created. The Sprite is represented in the Score by a line 25 frames in length. When the playback head moves beyond these 25 frames, the text will disappear. Director 7 now supports up to 1,000 separate channels in which the Sprites can appear, allowing you to create very complex screens.

The Score includes a number of special channels that govern the Movie's tempo, colour palette and transitions, along with two sound channels. However, the absence of DirectSound means you can't have two

sounds playing at once (for example, one containing music and the other a voiceover).

At a basic level, that's all there is to Director. Using these techniques, you could create very simple movies; but for serious multimedia or Web development, you'll have to get to grips with Director's built-in programming language, Lingo.

Unlike Toolbook's OpenScript, which is based on Visual Basic, Lingo was created from scratch. As a result, it's a logical



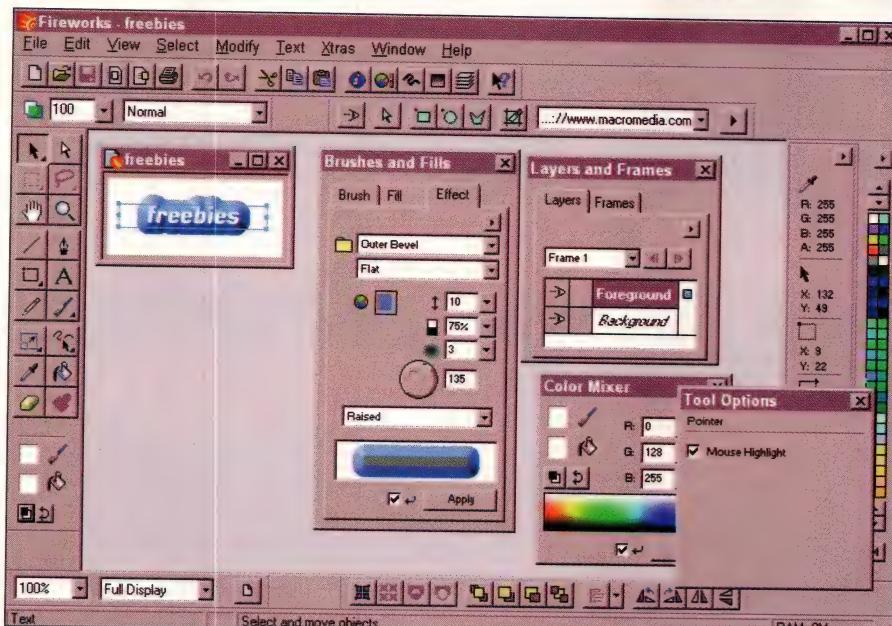
Lingo's new colour-coding and dot syntax make the language a bit easier to understand.

language to use and it's also easy to read, but it does mean a lot of re-learning for those of us familiar with VB or Delphi; it also means that Lingo doesn't always behave in the way you'd expect. Lingo scripts can be attached to Sprites or frames, in which case they're called Behaviours. Director includes a number of pre-scripted behaviours that are simply dragged onto the sprite or frame. You can also create scripts that are available to the entire movie, in a similar way to subroutines.

Once you've created your movie, version 7 gives you three choices for distribution. Director can package the movie into a single EXE file that includes the Projector, making Director a fine choice for applications intended to run entirely from CD-ROM. Director can also convert the Movie to Java for use in a Web page. The Java conversion process works well for simple Movies, but Java simply doesn't have the capability to reproduce many of Director's most useful features.

Director can also convert the Movie to Shockwave format for viewing on the Web by Shockwave-equipped browsers – and it's in this area that Director really wins. The ubiquitous Shockwave Web plug-in is included in Windows 98 and AOL 4, and gives Director a huge boost on its way to becoming the tool of choice for interactive Web development.

So, what else is new in Director 7? The Director 7 Shockwave Internet Studio, as it's now known, includes Fireworks and the sound-editing package SoundForge XP 4. Fireworks is particularly useful, as it allows you to create complex bitmaps for both multimedia and Web use without losing the ease of use and editability associated with vector graphics.



The Director 7 Shockwave Internet Studio includes Fireworks, used here to create the buttons for the menu using a bevel effect.

Macromedia is making some heavy claims regarding version 7's new playback and authoring engine, which is meant to dramatically improve performance and result in smaller files. However, I have to say that the difference is fairly small in my experience.

### Visible improvements

Of more general interest are those enhancements that will have a direct effect on how your project looks. Version 7 adds the ability to support alpha channels in imported 32-bit bitmaps. An alpha channel is a greyscale bitmap that sits above the main picture and defines how much of that picture shows through. Any black parts of the alpha channel will be completely opaque, while white parts will be completely transparent. By creating an alpha channel with a graded fill from white to black, for example, you can create the effect of a gentle fade. Although this may appear to be a fairly minor feature, it does open up an entire range of eye-catching effects.

For me, the most useful enhancement is the ability to rotate and skew Sprites with minimum hassle. Director has long included the ability to 'tween'. The word is derived

from 'in-between' and it refers to cartoon development where the lead artist draws the most important frames and 'in-betweeners' fill in the frames in the middle. In Director, you could add a Sprite at a certain position on the Stage, then move the playback head to a later frame and drag the Sprite to another position on the Stage. When the movie played, Director would move the Sprite smoothly between the two positions.

In version 7 you can, for example, add a sprite, give it a 270-degree rotation, move the playback head to a later frame, drag the sprite and give it a zero-degree rotation. While the movie runs, Director not only tweens the position of the sprite, but also its degree of rotation to give the effect of spinning.

Similarly, with native objects such as text or the new vector object, Director will now tween their colour. For instance, to make a text object appear to fade in on a white background, you'd begin with white text at the first frame, then change it to, say, red at a later frame. Director would automatically calculate the text colour in each intervening frame to give a smooth effect.

Macromedia has also made changes to the development environment. Pre-scripted behaviours are now presented in a more user-friendly library palette and Lingo is more familiar thanks to the inclusion of, among other features, 'dot syntax' so 'the left of sprite 1' has the alternative VB-like 'sprite(1).left'.

There are also a number of features that aim to reinforce Director's role in Internet

Later on in the movie, a new feature sees the menu items spin onto the screen.

production. You can now import HTML documents, preserving most of the formatting tags, and preview the current movie in a browser without having to exit Director. Improvements to Shockwave also mean that Shockwave movies can now be viewed outside of a browser.

The new vector object allows very small images to be created in a similar way to Macromedia's Flash (*reviewed issue 14, p96*). These are then anti-aliased on the fly. At last, Director 7 also adds support for the animated GIF format, giving access to the wide range of pre-created animations available in clip-art collections. As it's now possible to now have fonts embedded, you no longer need to install them on your end user's machine. It can also scale and anti-alias these more efficiently to produce smaller files.

Overall, the key difference for Web developers is that the Internet features have been brought within the Director 7 development environment. They're no longer add-ons or separate procedures.

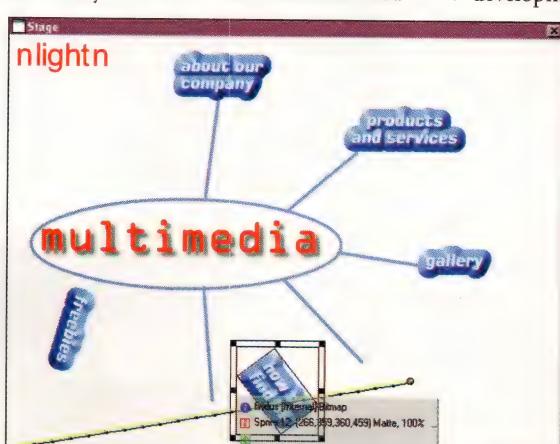
### Lagging behind the times

On the down side, however, despite all the improvements to Director's visual effects, its built-in transitions look positively stone-age when compared to almost any other authoring tool, even PowerPoint. Dazzler and Scala MM200, in particular, offer much smoother, more video-like effects and Director's 'reveal' and 'pixel' effects look sad in comparison. Director still doesn't use DirectX and therefore can't generate 3D fly-ons and rotations easily, nor does it support alpha-blends that use a bitmap as a template for creating transitions. I suspect the reason for this is to preserve cross-platform compatibility, but it seems a pity to deny PC developers the visual effects available in many other authoring systems. Also, the development environment can become rather confused and cluttered, so you really need a 19in monitor if you want to view a 640 x 480 movie and the Score at the same time.

Despite these criticisms though, Director 7 is a worthy upgrade which cements its position as the top dog in interactive Internet development. But the position with CD-ROM development is a little less clear. Due to its timeline-based nature, Director isn't really the ideal tool for creating multimedia with a high interactive content. However, for visually appealing programs containing lots of 2D animation and moderate interaction, Director should remain the tool of choice.

*Kevin Partner*

PC@UTHORITY	EASE OF USE	★★★★★
	FEATURES	★★★★★
	VALUE FOR MONEY	★★★★★
	OVERALL	★★★★★





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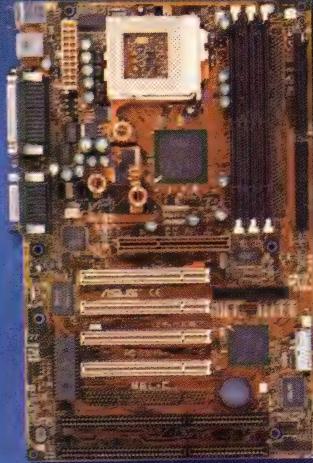
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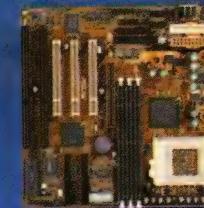
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# ACID MUSIC

## COMPOSITION TOOL

**VERDICT** The original loop-based composition tool is released in an excellent-value, cut-down version. It's ideal for working on ideas, but it misses some important elements of the more expensive Acid Pro.

**PRICE** \$199

**SUPPLIER** Moore Music (03) 9419 0344

**INTERNET** [www.mooremusic.com.au](http://www.mooremusic.com.au)

**AVAILABILITY** Now

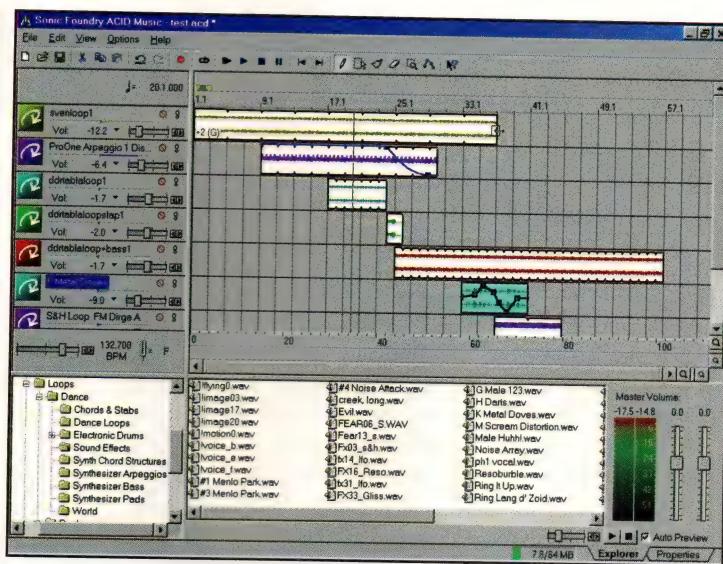
**SYSTEM REQUIREMENTS** Pentium/133, 32Mb of RAM, 5Mb of hard disk space, Windows-compatible sound card, VGA, CD-ROM drive, Windows 95/98 or NT 4.

Traditionally, the PC music-creation tool has been the sequencer. It built compositions in terms of sequences of data, covering what notes to play on which instruments, when and for how long, sent via MIDI to a synthesiser engine, which interpreted the data and output the appropriate music to its audio-outs. As the sequencer improved, it gained the ability to trigger the playback of pre-recorded digital audio snippets stored on a local hard drive. In this way, recordings of conventional instruments could be stored and played back alongside synthesised music.

For many modern musicians, however, working with digital audio snippets has become the most important part of the process. Most popular music is based around repetitive rhythmic and melodic motifs, which, once recorded, can be looped and inserted in the track when required. It isn't that simple, however. Once recorded, digital audio loops are of a fixed tempo and pitch. If, during the composition of the track in the sequencer, you want to change the pitch and/or tempo, the loop either has to be re-recorded or the tempo or pitch must be shifted in a wave-editing package. It's a fiddly and frustrating process.

Sonic Foundry's Acid solved these issues at a single stroke. It plays back any number of WAV files simultaneously, depending on your system, either looped or once. Editing is as simple as dragging WAV files from the Explorer window onto the Acid grid, then using the Pencil tool to size the clip over the appropriate number of 'bars'. Each WAV file deposited on the grid occupies its own track, with the horizontal axis representing time.

Where Acid really works is in its behind-the-scenes processing. WAV files that have been Acidised have the tempo and pitch stored alongside the rest of the wave data. If you set the master key of your composition to A and the tempo to 134bpm (beats per minute), then drop an Acidised WAV file of 120bpm in the key of C onto



the grid, Acid will automatically pitch and time-shift the WAV file in real-time to run at 134bpm in the key of A. With files that haven't been Acidised, the program estimates the raw bpm of the file and uses this instead, with a surprising degree of accuracy, even if it ignores the pitch. If you know the key of a file you've imported, you can Acidise it yourself by editing the properties sheet for the file and entering the pitch. Acid will shift it automatically. Pitch shifting can also be performed manually.

While your composition is playing, clicking on a WAV file in the explorer window prompts Acid to preview it looped in time alongside your song. In this way, browsing through riffs trying to find patterns that match is a swift and simple process. You can even superimpose volume and pan envelopes over tracks, allowing custom fades and pan sweeps to be set up.

The completed composition can be saved as a single stereo WAV file ready for burning onto CD, or in NetShow Active Streaming Format for use on Web sites. There's also a facility to record tracks using your sound card's audio inputs, provided it supports full-duplex operation.

While Acid Music doesn't feature all the functionality of Acid Pro (support for DirectX plug-ins and 24-bit audio support, for example), in most other respects it's identical. It offers a selection of loops in the Rock and Dance categories, with over 620 WAV files included, and it can be upgraded with Sonic Foundry ExpressFX DirectX plug-ins but can't be synchronised with other music programs. On a smaller budget, limited versions known as Acid Style have become available, featuring specialised sample libraries for one genre of music. So far Rock and DJ versions have been released.

Acid Music is a superb compositional

tool: even if you aren't a fan of working with loops, it's a useful way of throwing ideas together quickly prior to proper recording using sequencers.

There are drawbacks, however. The pitch and tempo shifting algorithms are excellent, considering they're performed in real-time, but there's an inevitable loss of quality, especially when changing either radically. For the best results, loops should be re-recorded in the appropriate tempo and pitch prior to mastering. There are also a couple of features absent, including a software tuning fork to aid identification of root notes of loops you've imported and, more importantly, a fully-featured wave-editing package. You can specify an external editor to use with Acid Music, and Sonic Foundry's own Sound Forge 4.5 is ideal with its facilities for working with Acidised files. However, a limited integrated version would be a useful inclusion, and would also improve Acid's ability to handle more complex looping. Although you can specify a sample to begin playback partway through, it's a fiddly business getting everything synchronised. Also, many one-shot WAV files have sections that would be ideal for looping internally, and there's no facility to handle this.

Sonic Foundry has obviously acknowledged the arrival of cheaper rivals like Mixman. If you intend using the package primarily for musical doodling, Acid Music is excellent value. On the other hand, if you want to master DirectX plug-ins and 24-bit operation, Acid Pro would make a better purchase.

Tim Ponting

PC @UTHORITY	EASE OF USE	FEATURES	VALUE FOR MONEY	OVERALL
	★★★★★	★★★★★	★★★★★	★★★★★
	★★★★★	★★★★★	★★★★★	★★★★★
	★★★★★	★★★★★	★★★★★	★★★★★
	★★★★★	★★★★★	★★★★★	★★★★★

# METACREATIONS PAINTER 5.5 WEB EDITION

## WEB DESIGN

**VERDICT** If you're serious about creating an outstanding Web site, MetaCreations Painter 5.5 Web Edition has the digital painting tools and anything else you'll need to get the job done.

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**AVAILABILITY** Now

**SYSTEM SPECIFICATIONS** PC: 486 DX processor or higher, Windows 95/98, NT 4.0 (or higher), 16Mb RAM (32Mb for Windows NT), SVGA video (24-bit recommended), CD-ROM drive. Macintosh: Power Macintosh (68K not supported); System 7.5 or higher; 12Mb RAM (20+ recommended); colour display (24-bit recommended); CD-ROM drive.

If you've been given the responsibility for creating and maintaining your organisation's Web site, MetaCreations Painter 5.5 Web Edition is a 'must-have' package. Designed as a digital paint and image editing program for graphic designers, it provides all the tools you need to produce stunning effects such as painting images with liquid and metal textures. For instance, make your site stand out by using droplets of water to distort underlying images through refraction, or add globules of shiny metal that behave like real mercury would. However, you don't have to be professionally trained in graphic design to benefit from what this software has to offer.

But just as importantly as its image editing capabilities, the package also contains the functionality required to optimise downloading of Web pages. For example, a large navigational graphic inserted in a homepage can be segmented into sliced images using Painter 5.5's 'Image Slicer Plug-in'. These smaller images can then be optimised and compressed in ways to match their content. In addition, a single link can be established for each unique sliced image, or selected images can be set up to act as JavaScript Rollovers. JavaScript Rollovers achieve simple animation by using image swapping to change its appearance when a mouse interacts with it (when the mouse is moved over the image, or a user clicks on it).

Painter 5.5 comes with extensive

documentation in the form of both online and hardcopy help. And for anyone who's just learning the ropes of designing Web pages, there's a tutorial covering the steps in designing three Web pages consisting of different components like a seamless background pattern, a logo, a bevelled button, an animated GIF file, a floater collage

(a floater is an image, or part of an image, that 'floats' above the canvas), and an image map, a handy feature that lets users jump to different Web locations by clicking different parts of an image - Painter 5.5 has the capability of creating both client-side and server-side image maps.

Being a highly developed package, Painter 5.5 has all the normal painting tools such as a grabber (for scrolling or 'panning' an image), a dropper (samples colour from an image), and a paint bucket (for filling an entire area of an image), as well as a range of selection, adjuster, shape design, shape objects and shape edit tools. But it is Painter 5.5's 'Natural-Media' tools that really set it apart from other packages on the market. These tools allow you to add in effects that match those that could only be achieved by using traditional artists' materials. Just some of the tools available are felt pens, charcoal, coloured pencils, crayons, chalks, watercolours, oils, plus a large variety of paint brushes including air brushes. However, one tool worthy of an extra mention is the image hose, a special sort of brush tool that allows you to paint with complete images instead of only colour. For example, you can load it with images of just about any description imaginable such as leaves, bark, stones, people, even cumulus clouds.

Other features of the software include adding special effects to pages using movies and animation. These include cloning: where imagery from one area is re-created in another part of the same document, or in a totally separate document; mosaics



Painter 5.5's interface can be customised to suit individual working requirements.

(painting with tiles): a fully customisable interface; and Net Painter, an innovative way of collaborating across the Web on special projects.

But if you haven't got the time to develop your own original Web page designs, there is another alternative. Painter 5.5 comes with ready-to-use Web content in two forms: the widely used GIF files, and RIFF files, the program's own native file format. The types of material available include buttons, objects, royalty free photos, horizontal rules, textures and patterns. The files in GIF format are ready for immediate use and don't require any further editing (unless of course you want to). And the RIFF files can be viewed using the program's own Browse feature and then added into a design whenever required.

Today, professional people browsing the Web for business expect sites to have a sophisticated look and feel, as well as be easy and quick to interact with. Painter 5.5 Web Edition from MetaCreations can help you produce the sort of Web site that meets this criteria.

Finally, a piece of advice. Because Painter 5.5 is such a comprehensive and sophisticated design package, be prepared to spend some time learning about, and then experimenting with, its many different features.

*Tony Stevenson*

<b>PC @UTHORITY</b>	<b>EASE OF USE</b>	★★★★★
	<b>FEATURES</b>	★★★★★
	<b>VALUE FOR MONEY</b>	★★★★★
	<b>OVERALL</b>	★★★★★

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**INTERNET** [www.homela.com](http://www.homela.com)

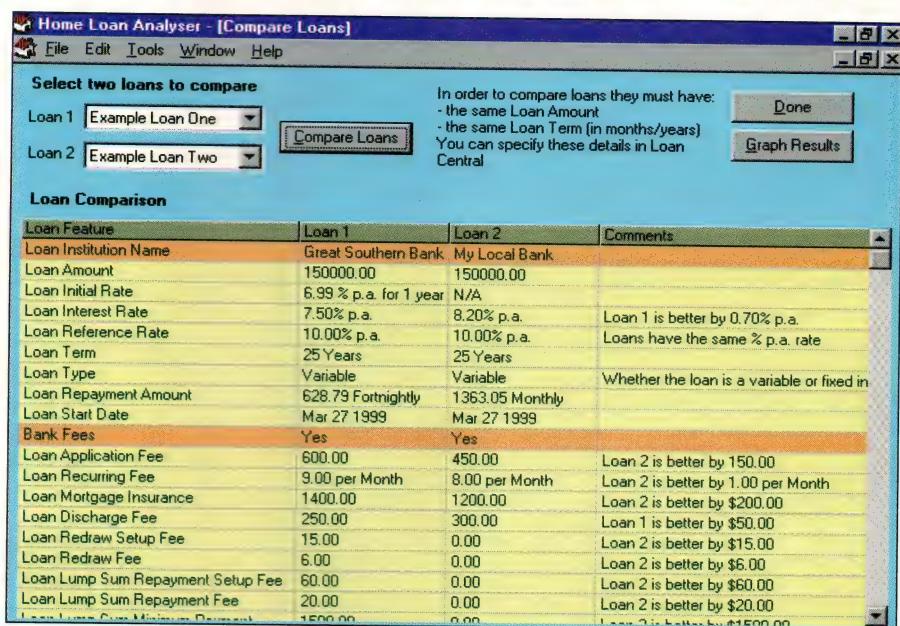
**AVAILABILITY** Now

**SYSTEM SPECIFICATIONS** IBM compatible

Pentium 75 PC or higher, CD-ROM drive, 16Mb RAM, 60Mb free hard disk space, Windows 95/98, or NT 4.0 (or higher).

**U**ndoubtedly one of the biggest expenses most of us will ever have to face in our lifetime is buying the family home, or homes depending on the number of times we move. Interestingly, the latest figures reveal that most middle class Australians only live in a particular house for less than 7 years on average. So it makes a lot of financial sense to get the best possible loan deal every time. However, trying to do that manually with the old-fashioned method of pen and paper can be both time-consuming and error-prone.

A better alternative is to capitalise on the power of your PC in conjunction with the computer program 'Home Loan Analyser Deluxe' (hereafter referred to as simply HLAD for brevity). This software, and its accompanying documentation, not only takes the hassle out of working your way through the different factors and requirements of getting a loan, it also has the potential to save you thousands of dollars in the overall cost of the loan. And it's worth remembering too, that sometimes with hidden costs, it's not always the lowest interest rate that necessarily represents the best possible loan arrangement. When borrowing, it's imperative that all fees charged over the entire period of the loan are factored in as well.



Easily compare the different features of two loans.

There are three major ways in which HLAD attempts to help you work out the best possible loan for your own requirements. Firstly, it provides the required functionality to compare two loans simultaneously. And to help you better make sense of the information, the package can graph a loan, or better still, two loans against each other.

Next, you can run any number of 'what if' scenarios. For example, you can determine the effect on a specific loan by changing the repayments from weekly to fortnightly or monthly, or calculate the differences between fixed and variable rates. Or perhaps see what happens with a lump sum repayment. The program also takes into consideration the effect of application and transaction fees, as well as any early termination penalties or discharge fees.

Thirdly, you can use the package to produce a variety of reports. These include both summary and detailed loan reports, along with loan application and home buyer's checklists. The loan application checklist is a series of questions you can take with you when applying for a loan. It has enough space on the printed form for both answers and comments to questions like 'What is your current interest rate?' and 'Is there a fee in changing from a variable to a fixed interest rate, if so, how much?'. The home buyer's checklist has been designed as a guide to what to look for when inspecting properties you're interested in buying. For example, 'Are the light fittings in good order, appropriate, or unsuitable?' or 'Is there sufficient natural light?'

Other features of the package include a loan affordability estimator – a quick way of working out what you can really afford based on items such as your income, the amount of

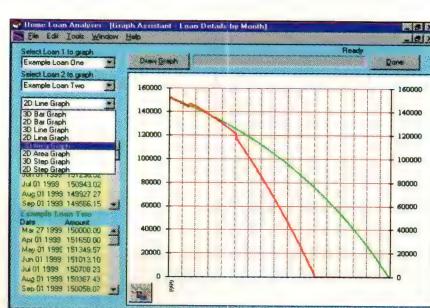
deposit available, current interest rates, and so on – along with a hardcopy help manual and online help. A 'Quick Start' tutorial is also provided that takes you step by step through using the package. And for people who have already taken out a loan, HLAD allows you to verify, and then vary, the details of an existing loan arrangement, as well as work out the real, as opposed to the perceived, value of utilising a mortgage offset account.

Summing up, here's what I regard as the major benefits of using HLAD. It's a convenient, and inexpensive way of independently analysing a loan. It has the potential to reduce both the costs and term of any loan you're currently considering. It's also a handy tool for investors who are attempting to manage multiple loans. It can be used to work out the best conditions, as well as timing, for refinancing a loan. And for people who are contemplating a major extension to their home, it can also be used to see the effect of adding the renovation expenses to their existing loan.

Finally, for a bit of much-needed relief, HLAD also comes with a fun game called 'Splat the Bank'. So after you've had a frustrating time attempting to negotiate a loan with banks or other types of lenders, you can harmlessly vent your frustrations by throwing rotten eggs or tomatoes at bank managers! A Lite version of the software is also available for users who don't require the full functionality provided in the Deluxe version.

*Tony Stevenson*

<b>PC @ UTHORITY</b>	<b>EASE OF USE</b>	
	<b>FEATURES</b>	
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Graph one loan, or alternatively, two loans against each other using a variety of graph types.



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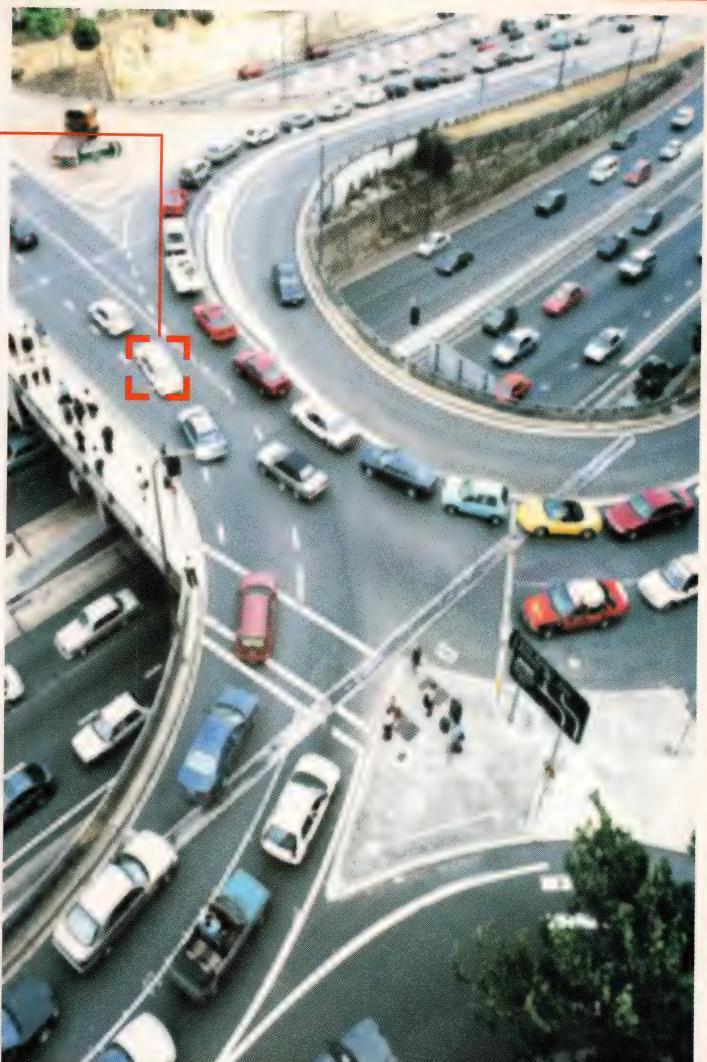
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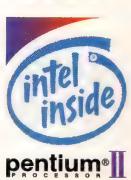
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# VISUAL CAFÉ 3, DATABASE EDITION

## JAVA DEVELOPMENT

**VERDICT** Visual Café 3 has benefited from some commendable improvements, and the inclusion of Swing support is particularly welcome. However, the help system is still in beta and the price doesn't compare well with VisualAge Professional.

**PRICE** Standard Edition, \$159; Database Edition, \$1,290

**SUPPLIER** Symantec (02) 9850 1005

**INTERNET** [www.symantec.com.au](http://www.symantec.com.au)

**AVAILABILITY** Now

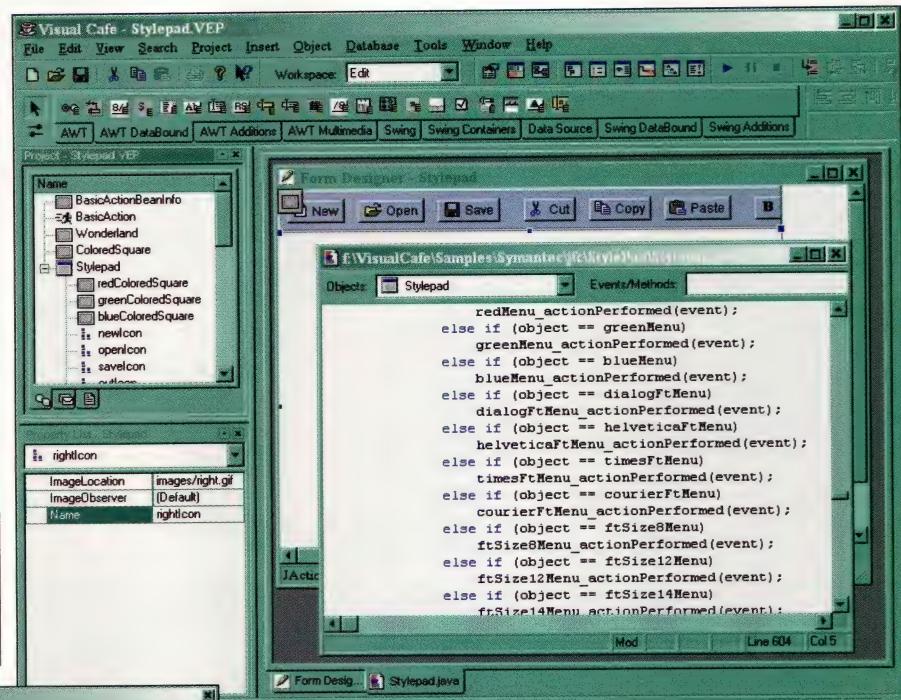
**SYSTEM REQUIREMENTS** Pentium/133, 64Mb of RAM, 165Mb of hard disk space, Windows 95/98 or NT 4.

**S**ymantec was one of the first to bring out a visually-oriented Java development system, but with the recent release of JBuilder 2 and VisualAge 2, it's clear that the time had come to up the stakes to version 3.

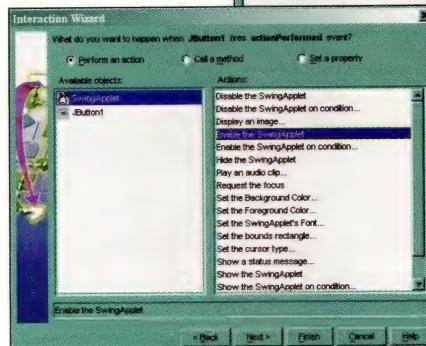
Café continues to be one of the few Java development solutions that keeps a foot in both camps – on the one hand you can use it to create 100 per cent pure Java code, whereas on the other you can use it to create fully-compiled, native code executables for Windows, although this will also require some run-time DLLs.

Newcomers to Visual Café will find that, like most modern development systems, it sports a component palette, property inspector and form designer windows along with a code editor window. Café will allow you to load multiple projects at the same time, and uses the same dockable window approach that was popularised by Microsoft's Visual Studio. Most of the windows can be docked as well as the various toolbars and the component palette itself. The main menu bar, however, isn't dockable, so interface traditionalists should perhaps be thankful for small mercies. A nice touch is the Workspace combo-box in the toolbar, which will instantly switch the visible window configuration between editing mode and debug mode.

Perhaps the most exciting addition is support for Swing components. Swing



Café 3 now sports a component palette that's bulging with Swing controls.



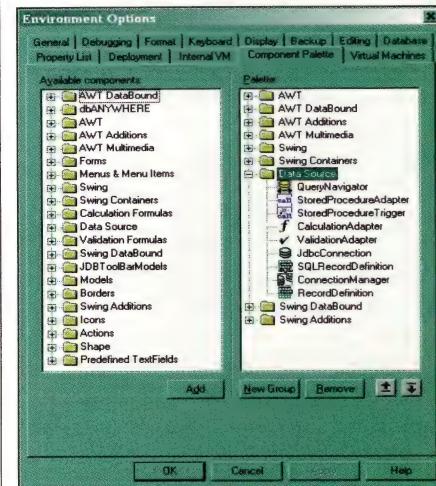
The improved Interaction Wizard makes it very easy to implement event handling in both AWT and Swing scenarios without writing any code.

their predecessors. In addition, Swing components provide a pluggable look and feel, allowing the appearance of a program to be easily changed according to taste. Indeed, one of the Swing components is a combo box which, if placed on a form, allows the end-user to select from among the standard look and feels that are implemented. Café 3 provides four component palette pages populated with Swing components and even throws in a number of the Sun Swing demo projects, while the Interaction Wizard has been enhanced to work with Swing controls.

### Conventional help

The Help system is conventional (in other words, it isn't HTML/Java-based), which means it's fast and responsive. However, it's not entirely complete; embarrassingly, the

'Welcome to Visual Café Database Edition' link is broken, and one can't help but wonder what the rest of a help system will be like if the authors can't even produce a working Welcome topic. The fact is, Café's help system contains a large number of broken links and is clearly unfinished. On the positive side, though, Symantec does supply a large chunk of printed 'tree-ware' as standard, which goes a long way towards making up for deficiencies in the on-line system. The documentation even includes a



StoredProcedureAdapter and  
StoredProcedureTrigger have been added to  
the DataSources palette page.

couple of manuals relating to Visual Page, the HTML page editor which is included as part of the package.

Like IBM's VisualAge Java development system, Café uses visual 'links' between different components in order to provide a simple 'no-code' approach to event programming. For example, suppose you want some action to be performed when you click a Swing button called JButton1. If you were implementing a Reset button, you might want to use it to reset the values of a group of JSlider controls back to their default values. So, you'd click the Reset button and then the slider control that you want to be the target of the action. At this point, the Interaction Wizard dialog appears and allows you to specify whether you want to call a method or set a property on the target. In this case, you might call the JSlider's setValue method to set the slider to some predefined value. It's an easy-to-use system, although inevitably it will be less appropriate for experienced developers who can just type in any necessary code directly. I do feel, however, that Café's interaction Wizard works a lot better than the equivalent query mechanism found in VisualAge. In version 3, the Interaction Wizard has been improved, but it can't always be relied upon if you mix and match technologies – you can't use it to create interactions for Swing components in an AWT container, for example.

Another welcome tweak in version 3 is automatic event binding for components, which is just a fancy way of saying that if you double-click on a component the IDE will bring up a dialog allowing you to select a new event handler to associate with the control. Should you elect not to display this dialog on double-clicks, the default event handler will be generated automatically and bound to the control. One giant leap for Java perhaps, but it's nothing spectacular for Delphi and Visual Basic developers.

### Database differences

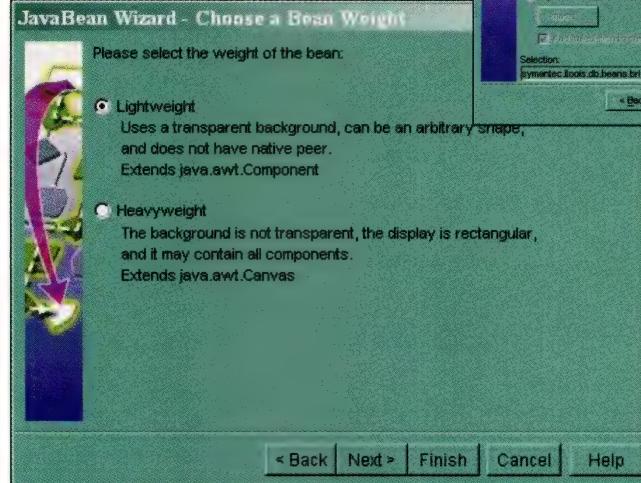
The Database Edition builds on the feature set of the Professional Edition but embellishes it with a large number of additional connectivity options. Three different categories of data-aware controls occupy their own pages on the component palette. First, there are the older AWT databound components, next there are the more recent Swing alternatives, and finally there's another palette page for the various datasource controls.

A quirky but interesting feature of Visual Café 3, Database Edition is the ability to use existing, non-data-aware AWT components as if they were indeed data-aware, opening the door to the creation of richer user interfaces as a result. This magic is cunningly achieved through the use of a special new component called a mediator. As the

name suggests, this component acts as a go-between, enabling a QueryNavigator object to be linked with a conventional data-unaware control. To use it, you just add a mediator to your form, set its Output property (somewhat counter-intuitively named – it could just as well be used for input) to the name of the AWT component you're using, and set up the Getter Methods and Setter Methods properties

so as to contain the text of a list of method calls to be executed on the AWT component; for example, 'getText()' to retrieve the text from an edit control. At the other end, you connect up the mediator's Data Binding property in the usual way. It's something of a kludge, but it does work.

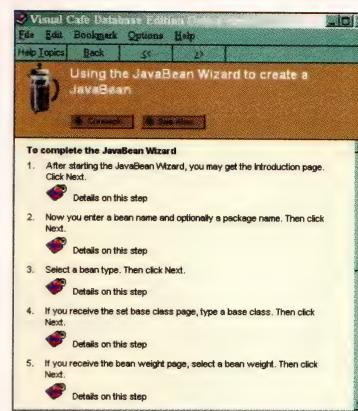
A number of other new wizards and customisers have also been added to Café 3 Database Edition. There's a DataBound Project Wizard for creating the basics of a new databound project. Using the Wizard, you can specify whether you want an applet or application (with or without JFC), go on



The new Bean Wizard makes it easy to create Beans from scratch.

to specify what datasource(s) you wish to use with the new project, and indicate what tables, columns and other controls are to be included. The bones of your new project will then be created, ready for you to flesh out the details.

There's a new CalculationAdapter component which can bind a specified calculation rule to a component. With a CalculationAdapter on a form, you can access the new Calculation Customiser through the properties window, select a predefined calculation bean such as DateSubtractFunction, define the inputs for the calculation and specify what happens to the calculated results. This sort



The less said about the Help system, the better. This particular topic is obviously a work in progress.

of functionality obviously makes it much easier to implement proprietary business rules in a layered architecture. There's also an improved dcNAVIGATOR (Data Connection Navigator) for quickly browsing and selecting from among the list of available data sources, and the IDE editor now includes JavaDoc support.

On the negative side, the overall responsiveness of Café 3 on my Pentium II/300 with 128Mb of RAM was sluggish – in fact, it even crashed a couple of times. The install program also adds a huge number of directories to the CLASSPATH environment variable and managed to trample all over my PATH



Custom calculations can be incorporated into database apps through the use of a new CalculationAdapter bean and associated Wizard.

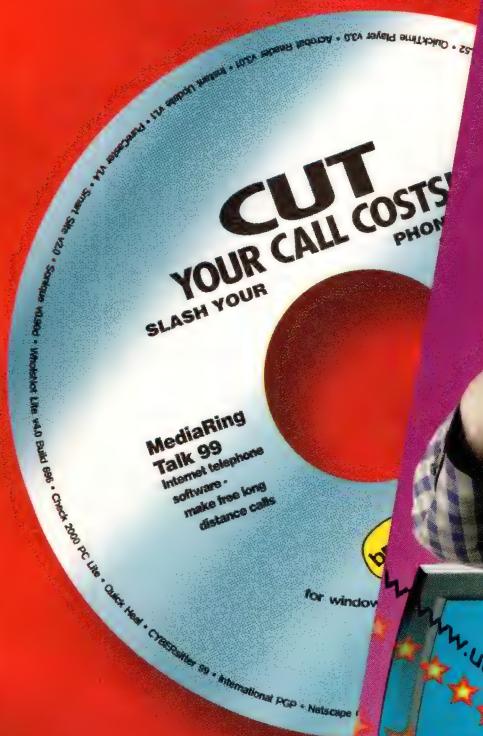
environment settings in the process. Thankfully, this was relatively easy to fix.

Although I like Visual Café 3, it's not as solid as IBM's

VisualAge 2, has a steeper initial learning curve and is fairly expensive too. That said, Visual Café does include an optional interactive tour on the CD, where you'll also find other goodies including Visual Café Pro 1, the JDBC-compatible dbANYWHERE server, Oracle Lite and Netscape Communicator. It's certainly a good development environment, but it falls short of being the best.

*Dave Jewell*

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**SYSTEM SPECIFICATIONS** 486/DX processor, Windows 3.x or higher. 8Mb of RAM (16Mb recommended). Hard disk space requirements depend on version.

Accounting packages in the middle range of the field have never been as easy to use as those in the lower ranges, such as MYOB. It isn't actually that long ago that most of them came over from DOS to Windows. Pastel Partner version 4.1 (reviewed issue 7, p105) was criticised for an overly complex user interface. Since then version 5 has come out with many improvements. Among them, printable documents and reports can be emailed. This can be customer-specific, so in a run of statements you could have ones for certain customers emailed automatically instead of printing them out. Or you could do both.

Customers with unusual terms, such as a given number of days, are not usually given statements specific to their terms. Version 5 now produces statements that make sense for these kinds of customers. There is an Assistant feature that works like a Wizard and guides the user through things such as counting inventory, setting prices, or balancing at the end of a point-of-sale shift. This has been used to simplify twenty areas of operation, and makes a very big difference to how easy Partner is to use.

One appealing and time-saving feature

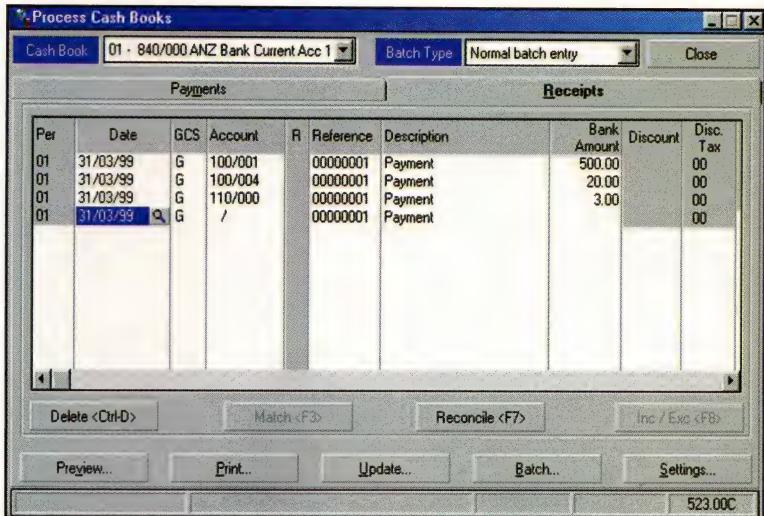
often used in these assistants, is the option to copy a long list of existing settings for one user or item to another, and then modify that rather than having to go through

the whole list of settings each time. Security is also further improved. One way is that processing of transactions for any user can be set up to exclude certain types of accounts. This feature prevents some common bookkeeping errors. There are small improvements to pricing. It would be a rare situation that isn't now provided for in the price setting options.

Help files are now better. Information is presented in detail and is easy to understand. Pressing F1 in any screen gives you help for that particular screen, and the how and why of what to do is explained well. Error messages are unusually detailed, explaining what has gone wrong and how to attempt to correct it.

Backups were improved from version 4.1 on. After backing up, Partner also does a test restore of each backup. This can be set to check if the backups will be readable after restoring. Seeing that a combination of floppy disks and Zip backups is notoriously unreliable, this is a very useful feature. Pictures, such as of inventory items, can be excluded from the backup, making the Zip file smaller.

The Point-of-Sale function has been set up for multiple operators in a wide range of situations. There is an easy-to-use window to quickly balance up to seven tills. Cost of stock items can be hidden as well as prompts for required information (such as security details for people who pay by cheque). Hot keys can also be set up so that common functions can be used with just one keystroke. The processing of point-of-sale transactions



The unhelpful cashbook processing window.

is done to disk at the end of a shift rather than as they are entered at the time of the sale. This makes the initial data entry faster and makes it easier to make changes. In version 5, security has been further improved so that you can, for example, restrict counter staff to using only point-of-sale screens, but also prevent higher-level users from accessing point-of-sale screens.

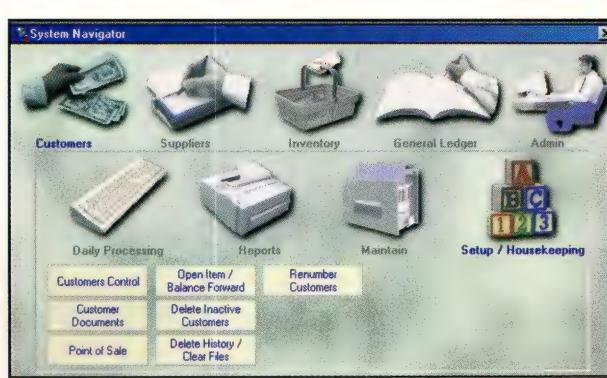
Although version 5 is a significant improvement over the previous versions, criticisms about complexity still apply. Point of sale interfaces especially, need to be simple, and Partner's is not. That would be all right if there is enough information easily visible on the screen to guide or remind the user, but often there isn't.

The System Navigator now has less steps for each function. Having said that, it still isn't as clear as the same kind of thing in entry-level accounting packages. In initial setting up, rather than actually leading the user through each step, each window presents a huge number of options, reflecting the power of the program, but no extra explanation. The bank reconciliation is still slow and unwieldy. For some reason, to mark a reconciled item takes two careful mouse clicks. The cash book entry procedure is still disappointingly unhelpful.

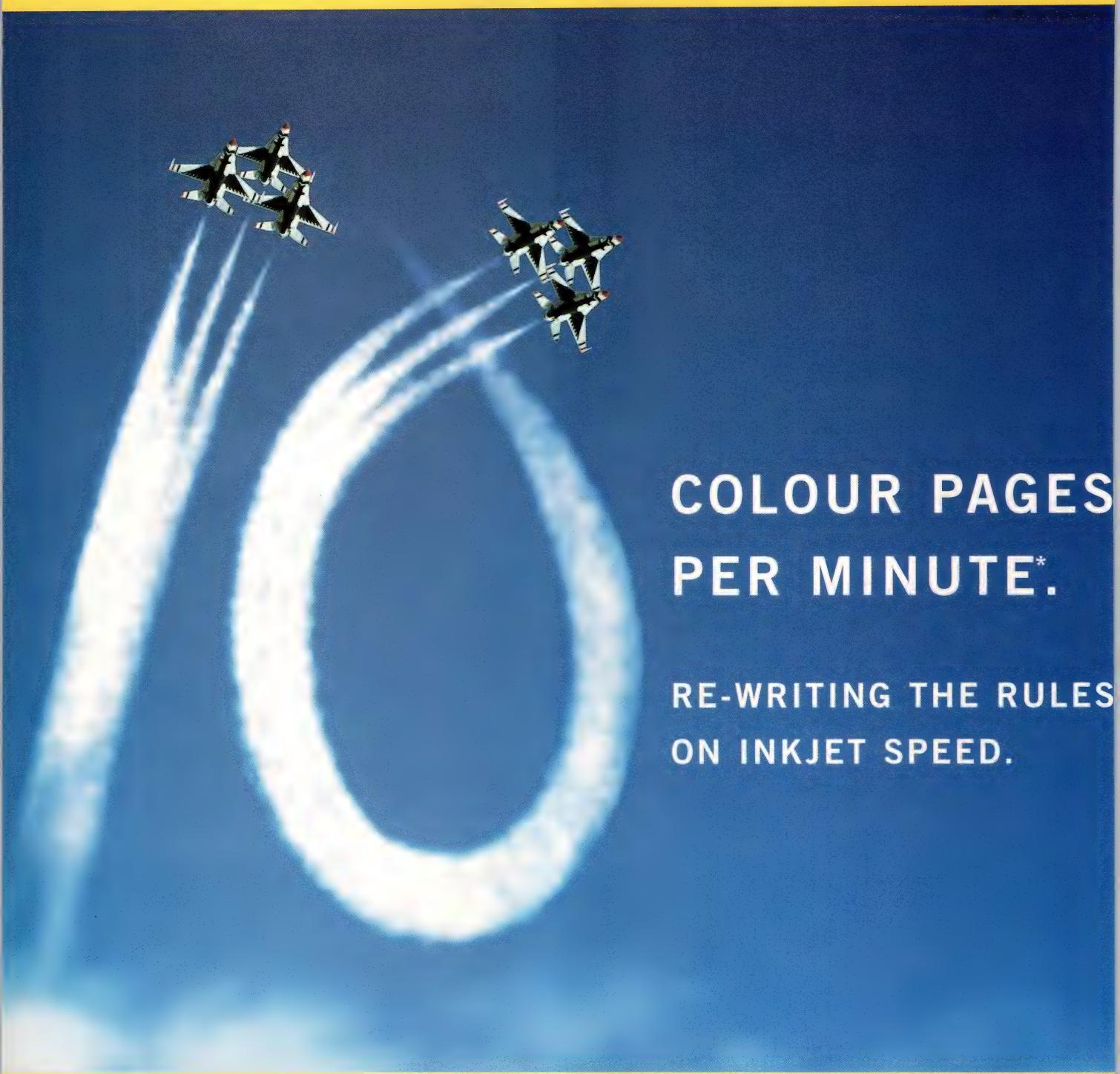
For the price, Pastel Partner 5 has a formidable range of features. But users should now expect virtually any program to be user friendly, even if it is powerful and complex. For the person at the point of sale or doing the bookkeeping, Pastel Partner could still be easier to use.

*Clem Roberts*

<b>PC @ AUTHORITY</b>	<b>EASE OF USE</b>	
	<b>FEATURES</b>	
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System Navigator is simpler in version 5 but could still be clearer.



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**PRICE** \$259

**SUPPLIER** Microsoft 13 20 58

**INTERNET** [www.microsoft.com.au](http://www.microsoft.com.au)

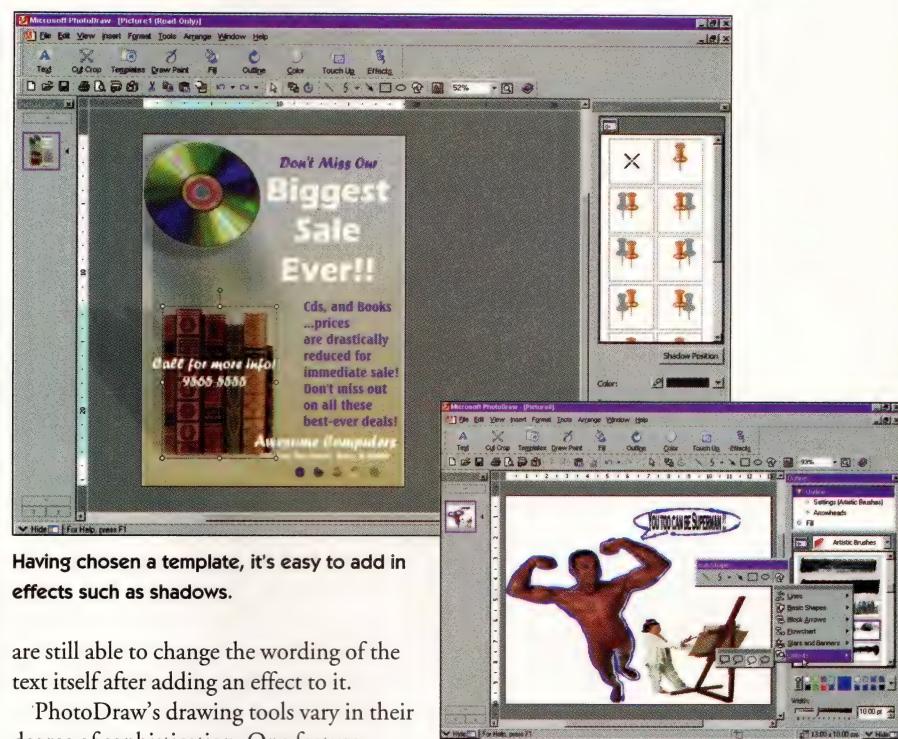
**AVAILABILITY** Now

**SYSTEM SPECIFICATIONS** Pentium 166MHz, 32Mb of RAM, Win 95, NT 4.0, 190Mb of hard disk space.

**M**icrosoft's PhotoDraw 2000 is a great program for anyone seeking an easy-to-use, all-in-one graphics package. The program combines graphics tools usually grouped in high-end programs that normally cost about twice the price, such as vector and bitmap painting and drawing tools, photo enhancement, text effects and basic 3D effects. This is combined with easy manipulation via pop-up windows, which feature a tool or an effect and its associated options. Also, as you would expect from a graphics program on the market nowadays, PhotoDraw accepts images from scanners and digital cameras, as well as having around 20,000 graphics and clip art images on the CD, while more are available from the Web.

PhotoDraw's interface emulates the look of a browser, with 'visual icons' that show an example of how a tool or effect works. In addition, Wizards step you through a few basic options for customising templates. However, the templates don't provide the same degree of handholding or options found in Microsoft's Office programs.

By combining integrated vector and bitmap tool sets in a single interface, PhotoDraw lets you take advantage of the strengths of each without worrying about the technical details. For example, you are able to edit, reposition and scale text at will (including full 360 degree rotation and bending), while still being able to selectively retouch and add effects to bitmap images. Another feature of PhotoDraw 2000 - unlike some other graphics programs - is that you



Having chosen a template, it's easy to add in effects such as shadows.

are still able to change the wording of the text itself after adding an effect to it.

PhotoDraw's drawing tools vary in their degree of sophistication. One feature allows you to add artistic brush strokes to create custom hand-drawn effects such as charcoal, dry brush or wet brush. Using the Photo Brushes to apply bitmap images to vector paths, you can create lines or shapes and then apply images such as barbed wire, bamboo or chain link. This can greatly enhance the richness of an image, but it can also add significantly to the redraw time.

Redrawing is one of the problems in PhotoDraw. Basically, it's slow, redrawing each step of the way through an effect. This means that if you decide to first add an effect and then change the effect's colour and transparency, the program will redraw the images three times, once after each step. While PhotoDraw is rendering the image you are unable to work on anything else. If you use a high-end program, PhotoDraw is probably going to be slower than you're used to for this process. Another strange effect is that while rendering, the image passes through a strange pixilated effect on screen before suddenly appearing in place, as clear as a bell. Naturally as more graphic elements are added, as well as for small changes in large graphics, there can be very long wait times while PhotoDraw is rendering.

With PhotoDraw, you don't have to decide ahead of time whether a graphic will run in print, on the Web or just onscreen. You simply create the graphic and then use a Wizard to save it as applicable for the media you intend. The Wizard will suggest different formats depending on where the picture will be shown (handy for those who don't know the strengths and weaknesses of each format) and is quite good at selecting

the best format for the job. For publishing to the Web, the Wizard also suggests various options, such as compression, indexing and download time. You can also specify more detailed settings to fine-tune image settings.

PhotoDraw handles image editing tasks quite well. Although it is not up to the level of applications like Photoshop or Illustrator, it is more than sufficient for the average user. The program offers its own special effects and 3D tools, as well as supporting Photoshop plug-ins (a very big plus). For those who wish for extra quick graphics there are 300 templates for Web banners and buttons, certificates, business cards, bulletins, labels, and logos. Following in the footsteps of many other Microsoft products, there are also a large number of extra templates and add-ins that can be downloaded from Microsoft's Web site for free. In order to download from Microsoft, you must be registered with Office Update.

Though the high-end market is well catered for in cross-media graphics programs, the other end of the scale often had to be satisfied with much more basic packages. PhotoDraw 2000 has adequately filled this gap, integrating advanced graphics tools into a well implemented, easy to use, and reasonably priced application.

*Jacinta Thomler*

PC @UTHORITY

EASE OF USE



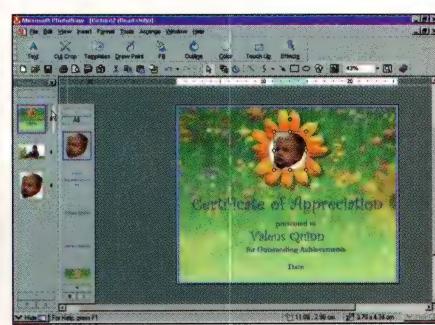
FEATURES



VALUE FOR MONEY

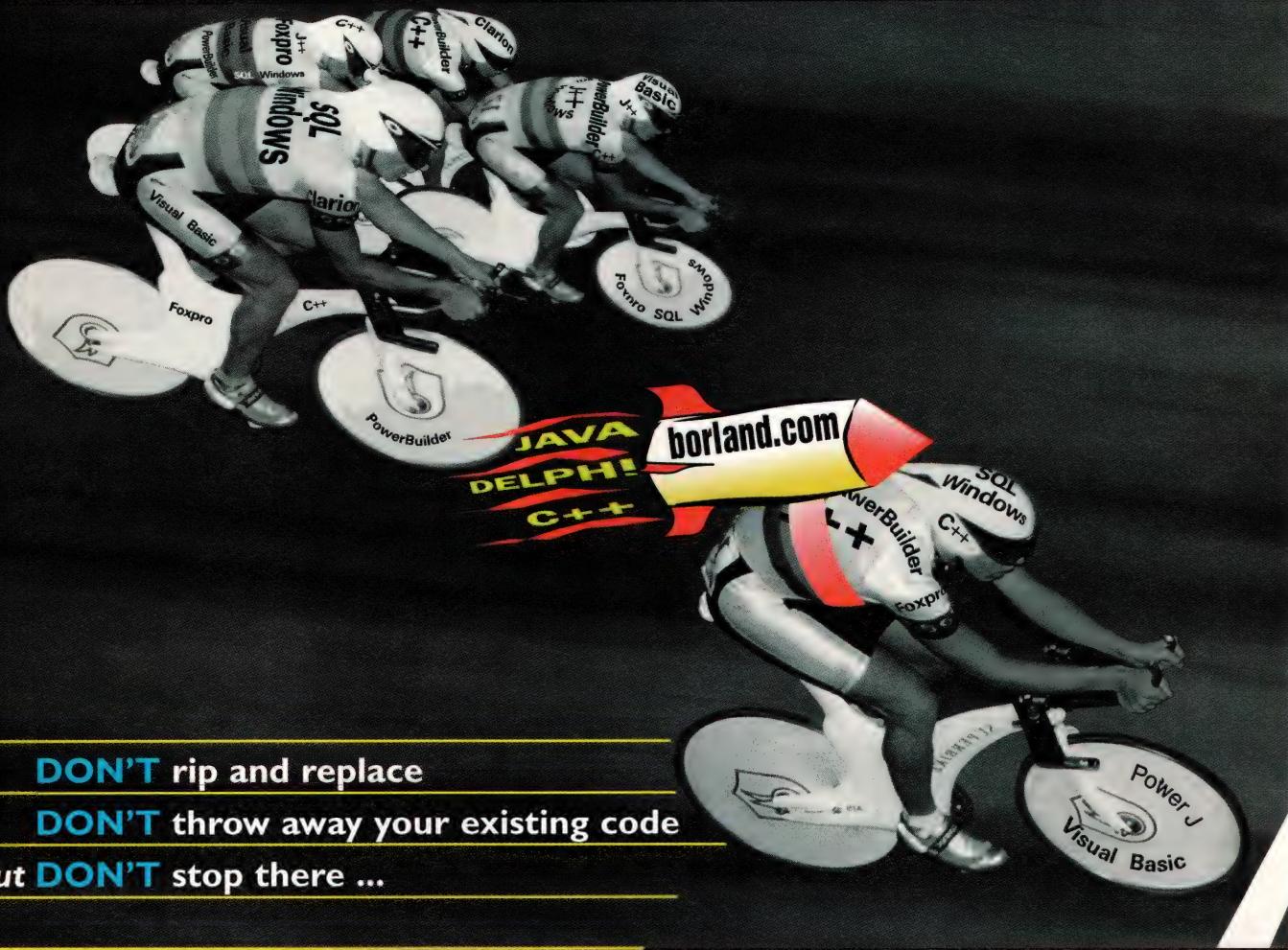


OVERALL



With PhotoDraw, you can take portions of one picture to another.

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# MAUS DEBT COLLECTOR

## ACCOUNTING

**VERDICT** A well-designed program with just about everything you need to actually recover debts. Bugs and inadequate help files make it difficult to use, to the point where some may give up.

**PRICE** \$199

**SUPPLIER** Maus Business Systems (02) 9957 3827

**INTERNET** [www.maus.com.au](http://www.maus.com.au)

**AVAILABILITY** Now

**SYSTEM REQUIREMENTS** Pentium Processor, Windows 95/98, NT 4 or later, 16Mb RAM, 30Mb of hard disk space.

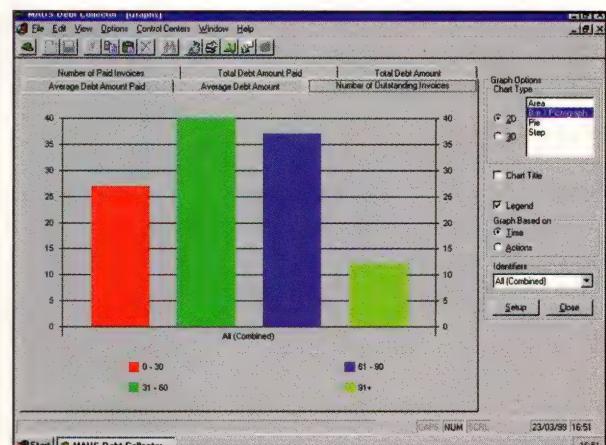
Most accounting packages don't offer much to help you keep your debtors down, other than a mail merge function. This is often more difficult to use than its other functions so most people don't bother with it. Maus Business Systems has picked up on this and released Debt Collector. This is a program that can import and store debtor information, do mail merges and keep track of what you've done to remind people about their debts.

The mail merge is particularly easy to use. A progressive timetable of four reminders (a phone call script and three letters) is there already. More reminder letters and phone scripts can be created and inserted into your schedule, and existing ones can be modified. The times for merging these four reminders are set but can be changed.

To do a merge can be a matter of pressing three buttons if nothing needs to be modified. A range of extra fields can easily be included on the letters, but I thought there should have been a function that combines all invoices due for a period in one letter. At the moment, Debt Collector produces five letters

at the same time if there are five invoices.

The contents of the letters and phone scripts are very well-worded and there is quite a collection to choose from. This part of the program adds an extra dimension in that it goes further than simply tracking what people owe. There is a wealth of information and templates to help in the debt collection process. These include: Staff training materials such as guidelines on how to speak to debtors and how to use role-playing to train staff, a staff assessment form template, legal advice and templates of legal documents as well as information on how to



Graphs contain useful information, but can't be printed, and one style can't be read.

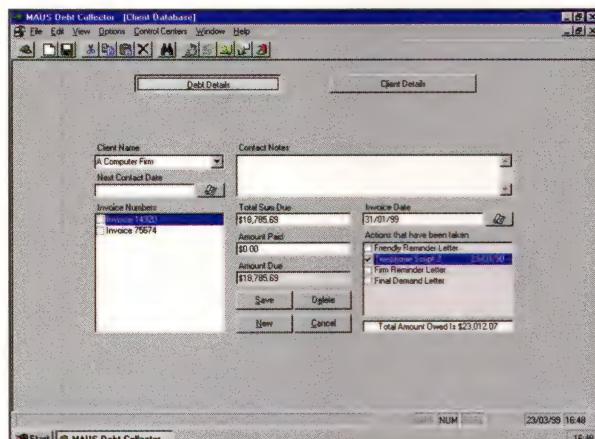
The MYOB import takes a lot longer but worked well except in the case of debtors who were listed with a first name and surname instead of a company name. Details for these appeared as double-entries in Debt Collector, once with debts owing but no address and phone number, and once the other way around. There will be a fix available for this soon, we are told.

The help files are lacking in content and detail. Sometimes you are led to expect a diagram where there isn't one, and sometimes one is needed but left out. The Quick Tour also isn't specific enough. It shows what pull-down menus contain and how windows open, but lacks the extra explanation needed to make sense of these pictures. The files are not good enough to get the average person using the program fairly quickly.

Less significant criticisms have to do with presentation. The opening screen will flicker noticeably when you press a button to go deeper into the program. This doesn't inspire confidence. There are useful graphs, but they can't be printed out and one style of graph is unreadable because the text is too small and distorted. Also, the way notes on customers and invoices are entered and accessed could be made easier.

I was excited at the beginning about what Debt Collector was capable of for the money, and how useful it obviously would be. But, the level of difficulty associated with importing and using the data is disappointing and made me feel like giving up. I think many users will react like this. Let's hope these problems are fixed soon. Debt Collector deserves to succeed.

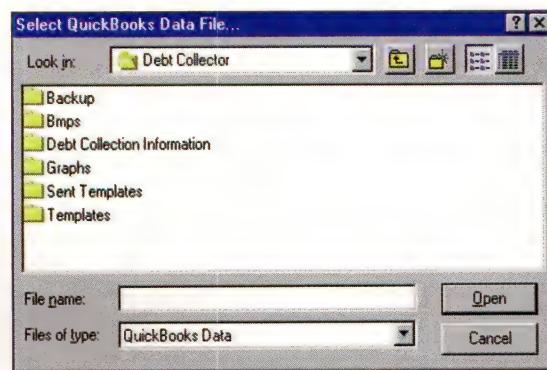
Tom Matsukubo



One of the ways debt information can be viewed in the database.

design an invoice so that the customer will notice it and take it seriously. This last part comes in the form of a lurid video display.

There are two important areas in which Debt Collector needs to be improved: how imports are handled, and the contents of the help and tutorial files. When you do an import out of QuickBooks, the import will abort and QuickBooks will crash if it has any data in the Job Description field (a field that would often contain data). To date there is no fix for this problem other than deleting the data from this field in QuickBooks before doing the import. Without data in this field the import worked perfectly. To import QuickBooks data there is no need to first export a text file from your accounting package and then import that file. You just find the QuickBooks data file from within Debt Collector, press a button, and the data is pulled in.



Just point to where your Quickbooks data is, and Debt Collector will import it.

<b>EASE OF USE</b>	
<b>FEATURES</b>	
<b>VALUE FOR MONEY</b>	
<b>OVERALL</b>	

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**AVAILABILITY** Now

**SYSTEM REQUIREMENTS** Pentium/166, 16Mb of RAM, 80Mb of hard disk space, Windows 95/98 or NT 4.



In order to get an idea of Mathcad 8 Professional, imagine having the knowledge gained over centuries of mathematical pursuit at your

fingertips. Add to this the ability to do 3D graphing and integrate your hardcore maths work with other relevant applications.

While Mathcad is instantly accessible to those who already know and love maths, it isn't too frightening for those technical professionals or scientists who could use such a tool but don't have the time or patience to learn the complicated syntax that has traditionally characterised computer-based mathematics. The prime feature is that equations can be input as you would write them down on paper. Think of it as a mathematical wysiwyg interface, using the symbolic language of classical maths.

You can work on equations directly on the screen, and Mathcad will make any necessary calculations immediately and display the

results. You can integrate graphs and text onto a single worksheet, as in more traditional mediums, but when you change any variable in an equation all the resultant effects are displayed in real-time. Any graphs that are affected change accordingly.

In terms of look and feel, little has changed since version 7, but fundamental aspects have moved on beneath the surface. Mathcad 8 uses a new calculation engine with enhanced analytical power. It features powerful new linear programming functionality to solve systems of equations, and the repertoire has been expanded to deal with Bessel functions, probability, statistics and data analysis.

Mathcad 8's new IntelliMath function is an agent that automates routine operations. IntelliMath will optimise expressions to their most simplified form and track and convert units on the fly to the correct SI units. In some ways it's similar to a mathematical version of Office 97's auto-correct. The AutoSelect subfunction of IntelliMath will analyse the on-screen maths and apply the best-solution algorithm. The software-based numeric and symbolic processors simultaneously screen mathematical expressions to devise the best solution.

Other improvements over earlier versions include new options for presenting your data, with enhanced formatting options and support for improved OpenGL-supporting 3D visualisation features. Like any recent application, Mathcad is also looking towards Internet and intranet publication. You can now save to HTML and include Hyperlinks inside your worksheets.

Of course, all this power at your fingertips can be intimidating, but if you've never used

Mathcad before there are two good places to begin. The user's guide is a great example of how such a document should be written – concise, lucid and instructive without being patronising. Chapter 2 introduces the Mathcad workspace and relevant toolbars, while brief tips are sprinkled through the guide to help speed up the learning process. A supplementary reference manual is provided as a lexicon to some advanced

nomenclature and offers advice on appropriate usage.

You could also start with Mathcad 8's Resource Centre. This launches as a separate window and functions very much like a Web browser. The overview provides a good introduction to what Mathcad 8 is, and what can be achieved with it. Basics like defining variables, functions, vectors and matrices are simply explained, while the instruction is written in language that all can understand. Even new users will be able to get to grips with constructing rudimentary quadratic equations, solving for the roots and finally graphing the solution. From here on, more advanced topics can be tackled, such as differential equations and 3D graphs.

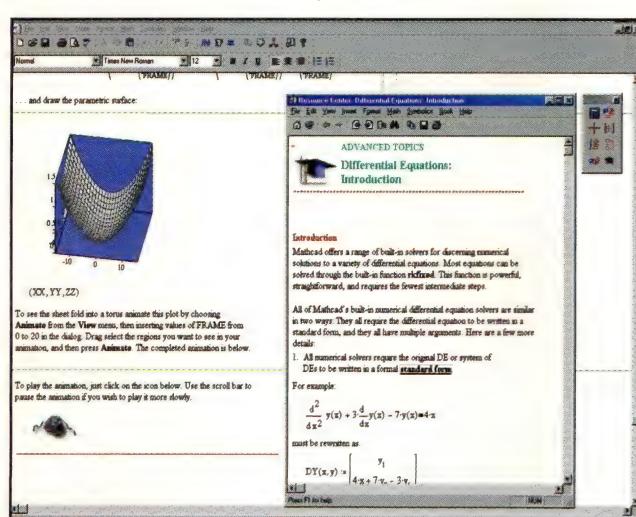
Mathcad 8 isn't exclusively reserved for mathematical purists, but it's easy to be overwhelmed by the Resource Centre's seemingly relentless repertoire of knowledge. There are nine key sets of data beginning with basic science references to calculus reference formulas. Chemists, engineers and geologists will find the remaining reference categories wholly relevant to their professions. Tables of data pertaining to properties of metals, liquids and gases provide the empirical data necessary to carry many applied calculations, and the reference information is broad ranging enough to encapsulate an up-to-date Periodic table and Earth science data. Students in these fields will find the Resource Centre an indispensable one-stop shop of prized knowledge. And as time moves forward, the Web Library serves as a gateway to a diverse selection of specialised projects accessed from the Internet.

Ostensibly a side application to Mathcad, MathConnex meets the demands of the real-world project-based work that frequently occurs in industry. It's described as a 'visual project design space', a powerful package that can be used as a component integrator to model the behaviour of a complex assembly. A hierarchical structure of entities aids the user in building logical projects.

Further analysis beyond Mathcad 8's remit may be passed over to other analysis applications. Compatibility exists for Axum, Microsoft Excel, S-PLUS and MATLAB. Mathcad 8 worksheets can be edited directly within an Excel spreadsheet, and conversely, data and computations from S-PLUS and MATLAB can be integrated into Mathcad.

There are few real criticisms that can be levelled against Mathcad 8. Yes, you need a powerful PC, but it's a complex package, not a bloated one. The \$895 asking price seems tiny when compared to the wealth of knowledge and problem-solving power on offer.

*Fai Lee*

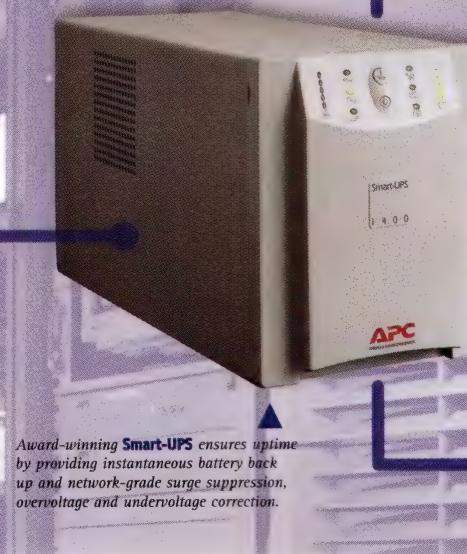


The Resource Center makes Mathcad 8 a powerful tool for learning.

<b>EASE OF USE</b>	★★★★★
<b>FEATURES</b>	★★★★★
<b>VALUE FOR MONEY</b>	★★★★★
<b>OVERALL</b>	★★★★★

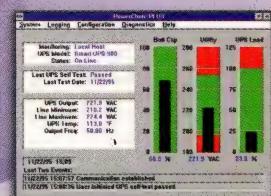
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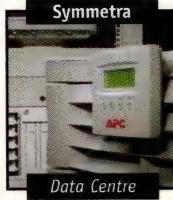
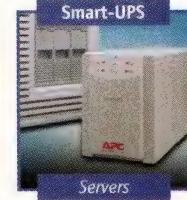
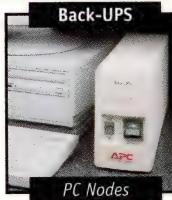
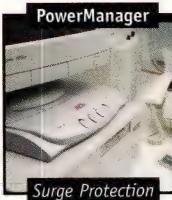
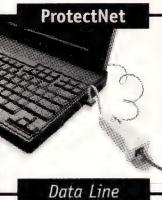
APC PowerChute *plus* ships with Smart-UPS and provides graceful, automatic shutdown in the event of a power outage and valuable power and UPS diagnostics for multiple operating systems



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# VISUAL J++ 6.0 DEVELOPER'S WORKSHOP

## PROGRAMMING

**VERDICT** It isn't cheap, but it's currently the best book available on the new Visual J++ 6 development system.

**PRICE** \$99.95

**SUPPLIER** Microsoft (02) 9870 2100

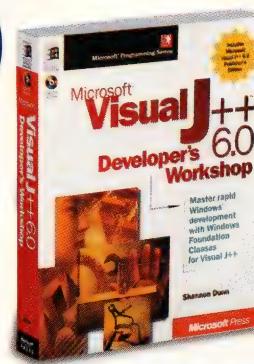
**INTERNET** [www.microsoft.com/mspress](http://www.microsoft.com/mspress)

**ISBN** 1-57231-925-9

If you're sat there with a brand-new copy of Visual J++ 6, wondering what to do with it, you're not alone. Microsoft's copious reference materials are undeniably comprehensive, but they aren't a particularly readable introduction to the capabilities of Visual J++ 6. To make matters worse, this new development system offers little in the way of sample projects to get your teeth into and, the few other Visual J++ books doing the rounds are, for the most part, just a rehash of Microsoft's own documentation.

Fortunately, this book is different. *Visual J++ 6.0 Developer's Workshop* takes a very practical, hands-on approach to Java development. Earlier books fought shy of discussing WFC programming (Windows Foundation Classes, the Java-based class library that forms the backbone of Visual J++), but here the author dives right in with a solid overview of the main WFC packages before showing how to create your first 'Hello World' application. This is followed by chapters on the use of forms, including how to create a persistent window that can retrieve its state from the Registry, menus, toolbars, context menus, tree views, drag-and-drop support and all the other goodies that today's users expect from a modern application.

Everything is approached from a WFC perspective, and it's this that makes the book so worthwhile – it's certainly the first readable introduction to the new class



framework I've seen. Database devotees, for instance, will appreciate chapter seven which discusses ADO within the context of WFC programming, explains the intricacies of the Data Form Wizard and illuminates the subject of binding form controls to fields in a dataset.

Throughout the book, the author develops various programs, the source code for which is included on the companion CD along with IE 4 and the book itself in the shape of a CHM (compiled HTML) file, which makes it easier to search for specific material. Less useful is the inclusion of what's referred to as the Publisher's Edition of the development system, which turns out to be nothing more than a 90-day trial. Despite this, the book's practical, no-nonsense and accessible approach makes it the best reference book currently available on the subject.

*Dave Jewell*

<b>PC @UTHORITY</b>	<b>DESIGN</b>	★★★★★
	<b>CONTENT</b>	★★★★★
	<b>VALUE FOR MONEY</b>	★★★★★
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# MCSE TRAINING GUIDE TO NT 4

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**M**icrosoft Certified Systems Engineer (MCSE) qualifications have recently become *de rigueur* for many IT personnel, creating a vast market for teach-yourself manuals. Unfortunately, the sheer volume of texts flooding into bookshops means choosing the right one can be rather tough. Thankfully, New Riders' latest effort happens to be one of the better examples.

Guided by the curriculum for exams 70-073, the book's contents reflect the requirements of the course. Organised first by major exam topics, then by individual exam objectives, the manual faithfully covers implementation and support of Windows

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The layout is rigid but surprisingly user-friendly. Chapters begin with a list of objectives, each of which is followed by a brief explanation and an overview of the material covered in the chapter and where it can be found. Each objective is also re-stated at the start of its section. This structure makes it extremely easy to access the information you need and, given the nature of the subject matter, this is very welcome.

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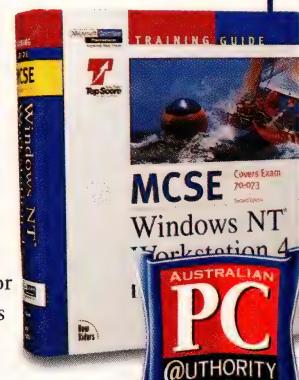
As well as the bound manual you also get a CD. This contains the full text of the

manual, practice exams, flash cards, study cards and an NT 4 software simulation that lets you loose on the software without interfering with an existing installation – an inspired idea for those without access to a test system. However, the CD's main advantage is greater functionality and flexibility for exam practice and test exams. For example, the comprehensive tests (graded for beginners through to advanced) can be randomised, customised for a particular subject, or used as a complete exam.

The \$99.95 price-tag may seem like rather a lot for a straightforward study guide – even one as good as this – but, when you consider the extra content on the CD, it's much easier to justify and comes heartily recommended.

*André Levy*

<b>PC @UTHORITY</b>	<b>DESIGN</b>	★★★★★
	<b>CONTENT</b>	★★★★★
	<b>VALUE FOR MONEY</b>	★★★★★
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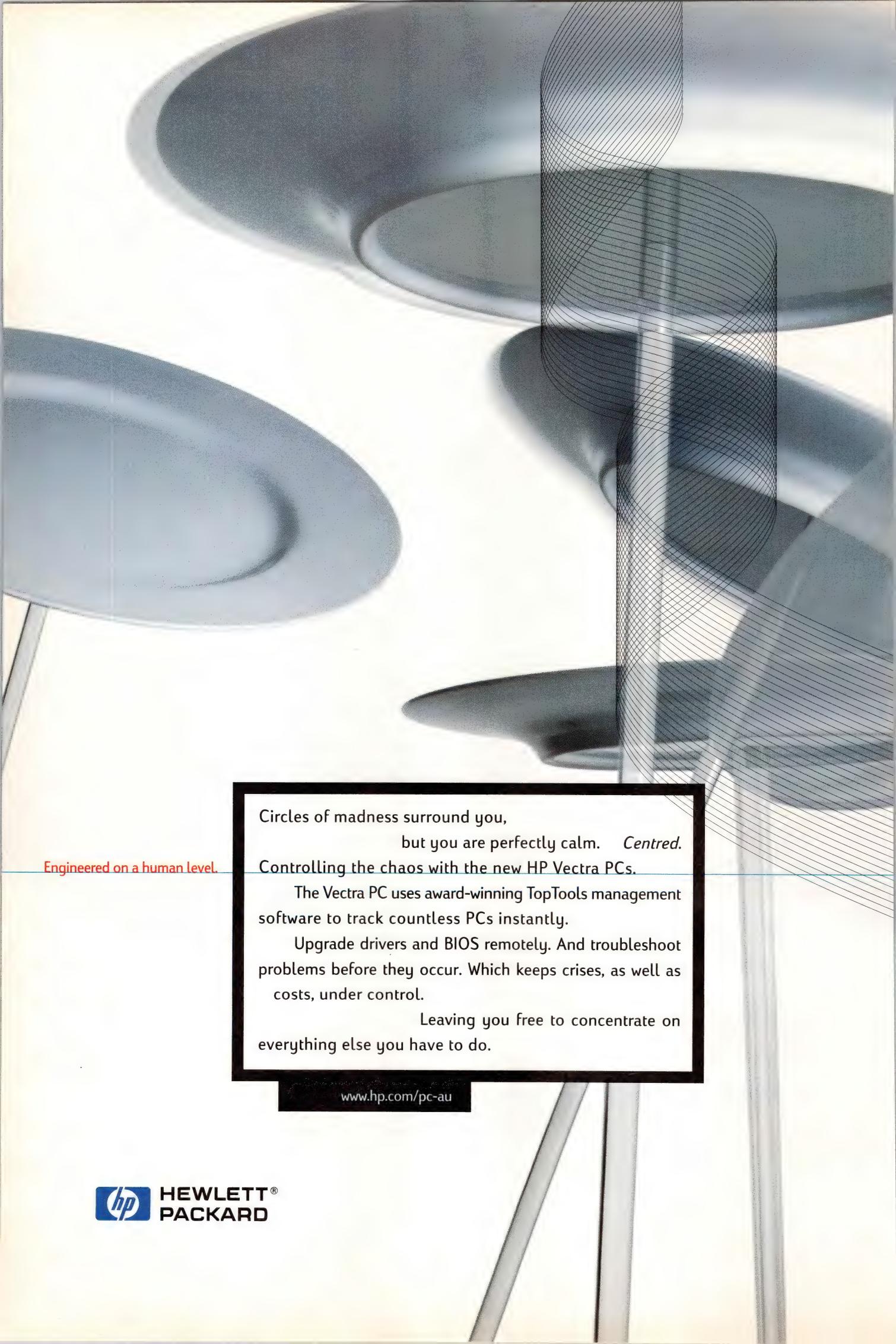
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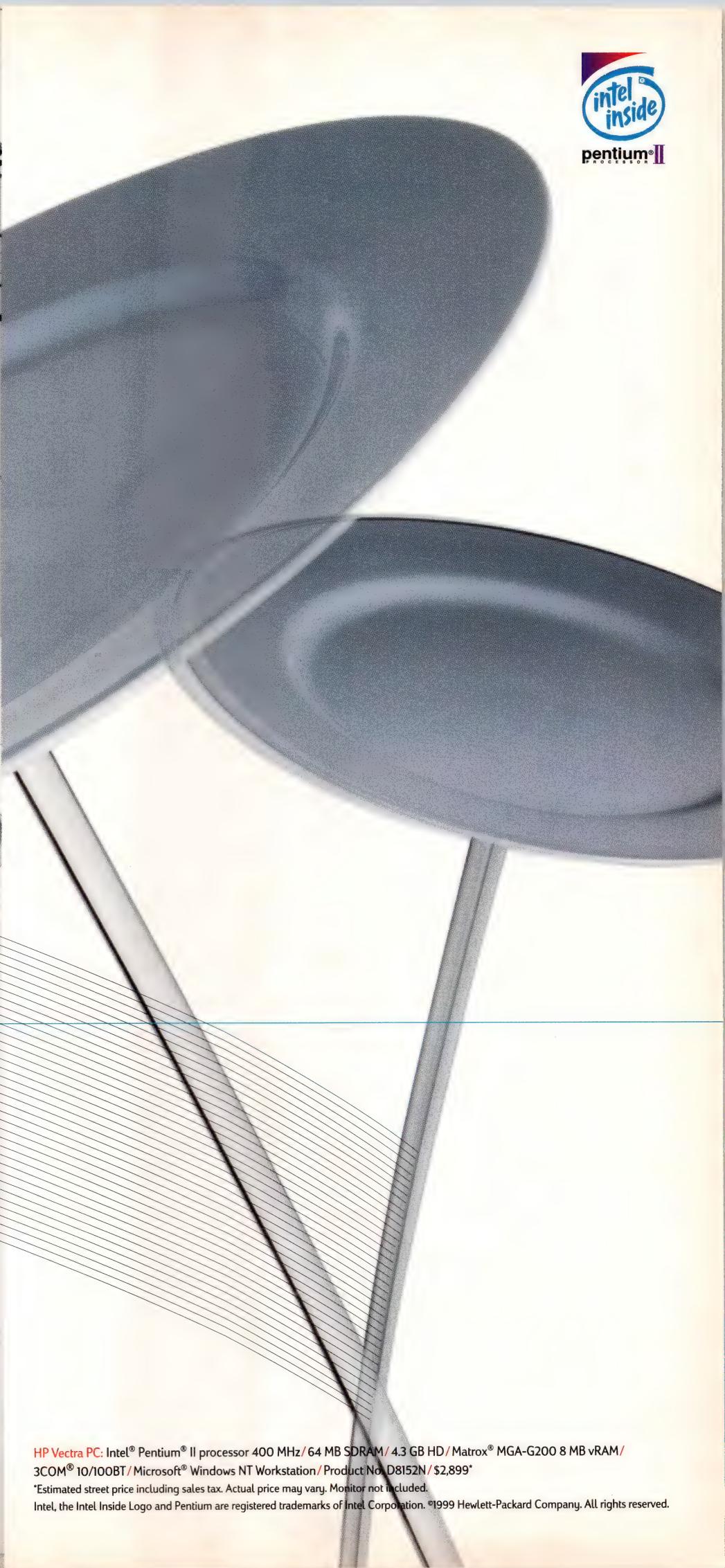
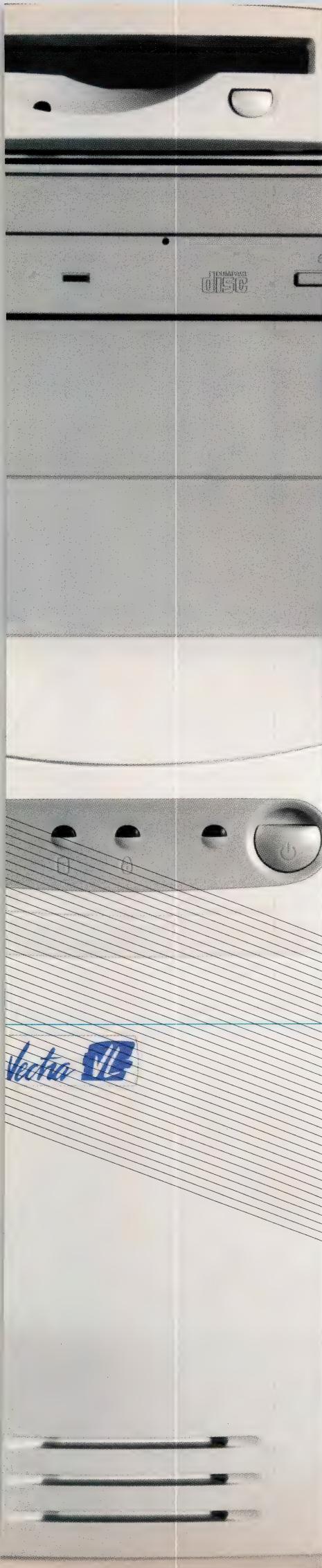
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# THE HACKER'S HACKER

IS FREE SOFTWARE TOO GOOD TO BE TRUE? JACK SCHOFIELD

MEETS RICHARD STALLMAN, THE MAN BEHIND GNU AND THE LINUX OS.

**R**ichard Stallman likes and supports the Linux operating system, which is hardly surprising since he wrote quite a bit of it – certainly more than Linus Torvalds. If there's a bee buzzing in Stallman's metaphorical bonnet, it isn't about the content or quality of the huge suite of code casually referred to as Linux. The name itself, however, is another matter. Stallman always refers to it as GNU/Linux, to reflect the fact that much of the 'Linux distribution' (what you get on CD-ROM from a distributor such as Red Hat) was originally put together as part of his own GNU project at the Free Software Foundation.

GNU stands recursively for 'GNU's not Unix' (the 'G' is hard). Stallman was the principal or initial author of GNU Emacs, the standard Unix text editor, the GNU C Compiler (GCC), the GNU Debugger (GDB), and parts of other programs that are usually shipped as part of Linux distributions. Stallman was also responsible for devising the General Public Licence or GPL (sometimes known as copyleft), which provides a simple route for programmers to release their code as free software. Of course, it's quite romantic to think that a Finnish university student, Linus Torvalds, single-handedly knocked out a whole operating system that turned out to be better than what hundreds of Microsoft engineers, or thousands of IBM's programmers, could manage in a decade. Romantic, but wrong. The real reason we have an entirely free operating system available today is because Stallman, Eric Raymond and hundreds of hackers like them spent 15 years creating it.

Over dinner, Stallman explained how the GNU project, which started in 1984, somehow turned into Linux.

'By 1991, we had every necessary major component except the kernel,' Stallman recalls, 'so we had almost completed a free operating system. We were working on a kernel that we had started not long before, and I made a

mistake: I chose a design that turned out to be very hard to debug. I didn't realise how hard it was going to be.'

'So then along came Linus Torvalds. He didn't have a political goal – he wasn't out to change the world, he wasn't out to give users freedom to co-operate. He was a programmer who enjoyed programming. He felt like writing a kernel, which he did, and he got it to work.'

Stallman continues: 'He looked at the GNU General Public Licence and decided to release the kernel under that. Once that was done, it was a natural process to combine that kernel with the GNU system, and that produced a complete, free system. It wasn't precisely the GNU system, but it was the basic essence.'

'Confusingly, people have come to call this whole system Linux, which is the same name as that one component which Linus Torvalds wrote,' says Stallman.

'So, for the sake of both informing people correctly and giving credit where credit is due, I ask people not to call the operating system Linux, but GNU/Linux. That will distinguish it from the kernel, because lots of people get confused between that and the operating system. It will also give credit to the GNU system, which tends to get forgotten and written out of history. And, finally, when people are using this system, if they know it exists because of the GNU project's philosophical vision, they'll look at it, and think about it, and maybe if they agree with it they'll make an effort, a sacrifice even, for the sake of freedom. If they don't know then they're likely to dismiss its importance or relevance to them and not pay much attention.'

Calling it GNU/Linux also gives due credit to Linus Torvalds, without whose kernel, practical approach to distribution and all-round likeability, the resulting operating system would probably not have been such a success.

It's unlikely to happen: popular names usually get shorter, not longer. However, it isn't the trivial matter it might seem. Giving credit is an important element of the

ILLUSTRATION: Peter Garland



hacker culture in which the hackers are people who delight in understanding the intricacies of computer programs, not the ones who break into other people's computers. In the commercial world, programmers get paid for their work. No-one supposes that Mavis Beacon wrote a touch-typing program (sorry to disappoint her fans, but she doesn't even exist) or that Oracle's Larry Ellison knocks out database programs in his spare time when he isn't sailing. Unless they're selected for stardom by a passing author or desperate public relations officer, the only way most commercial programmers get any credit is by hiding their names in 'Easter eggs' that can be called up only by an obscure combination of key presses.

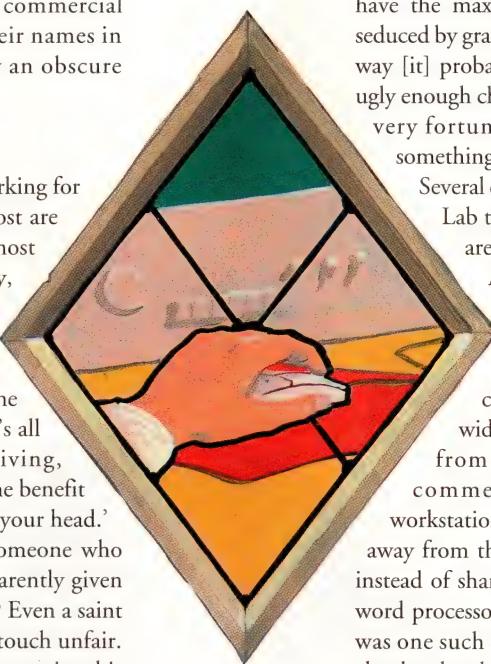
### The hackers' hall of fame

However, hackers are different: they aren't working for money but for a modest amount of fame. Most are members of a gift-based culture where the most kudos comes to those who give the most away, be it text editors, email programs, scripting languages or operating system kernels. Eric Raymond, who is the second biggest contributor of GNU code after Stallman and the founder of the Open Source Initiative, says it's all about 'voluntarism, co-operation, gift-giving, building community. It's about working for the benefit of everyone without anyone holding a gun to your head.'

Working for credit is great, but what if someone who contributes an operating system kernel is apparently given the credit for creating the whole environment? Even a saint could be forgiven for thinking that this was a touch unfair. While Stallman may sometimes pretend to be a saint, his intentions are entirely humorous. 'I'm making fun of my own mission,' he says. But if Stallman isn't a saint, he's certainly a man with a mission. He wants to create a world where software is free. This doesn't necessarily mean that the price of the software is zero, but rather that it isn't proprietary. Think 'free speech' rather than 'free beer', he says. 'My philosophy is that as a matter of ethics, software should be free,' Stallman says. 'Computer users are entitled to the right to modify and redistribute software. It's anti-social to stop them. It's anti-social because it makes for a worse society, a society where we don't have community.'

Stallman explains the ideas behind his views on the GNU Web site at [www.gnu.org/philosophy/](http://www.gnu.org/philosophy/), and that's the best place to read about them. However, it's also important to appreciate that his philosophy wasn't conjured out of thin air. It came from the hacker culture that used to exist in the famed Artificial Intelligence (AI) Laboratory at the Massachusetts Institute of Technology in Cambridge, just across the river from Boston on the east coast of the US. More precisely, it came from the destruction of the AI Lab's hacker culture, an event that Stallman found personally devastating.

Starting in 1971, Stallman worked at the AI Lab developing ITS, the Lab's own Incompatible Time-sharing System. It was a neat example of hacker humour, because what ITS was incompatible with varied over time. The AI Lab was the kind of place where professors who locked their doors, thus preventing access to their valuable computer terminals, might find their doors knocked down. And there was, deliberately, no security at all on the computer, not even



### • COMPUTER USERS ARE ENTITLED TO THE RIGHT TO MODIFY AND REDISTRIBUTE SOFTWARE. IT'S ANTI-SOCIAL TO STOP THEM. •

file protection. It suited Stallman: he once said that the result was 'a smoothly functioning anarchy, and after my experience there, I'm convinced that's the best way for people to live.' At MIT, Stallman also found himself in a community that shared program code, and so 'had the chance to experience it, and recognise what the advantages were,' he says. 'Then I was suddenly projected into living with proprietary software, so I saw the contrast very starkly. By being forced to face this change all at once, I was able to have the maximum possible resentment for it: I wasn't seduced by gradual change into accepting it little by little, the way [it] probably happened to many people. This was an ugly enough change that it inspired me to say no. And it was very fortunate for me, because it inspired me to do something useful with my life!'

Several events contributed to the destruction of the AI Lab that Stallman knew and loved, some of which are described in Stephen Levy's book *Hackers: Heroes of the Computer Revolution* (Penguin, 1994). In short, there were two main changes. The first was the growing realisation among some members of the community, both at the AI Lab and in the wider world, that they could make pots of money from their skills. That might mean joining a commercial company like Symbolics, a Lisp workstation manufacturer which hired many people away from the AI Lab, or by selling proprietary software instead of sharing it with the community; Scribe, the first word processor, developed at Carnegie-Mellon University, was one such example. The second type of change, albeit closely related to the first, was the AI Labs' decision to switch to using proprietary (commercial) operating systems instead of ITS, which had been written in-house for DEC PDP-6 and PDP-10 minicomputers. According to Stallman, once most of the AI Labs' hackers had been enticed elsewhere, there simply weren't enough of them left to keep developing ITS. However, once the PDP-10 had hit the dustbin of computer history, it probably wouldn't have had much of a future anyway.

### ITS folklore and a mythical culture

In *The New Hackers Dictionary* (MIT Press, 1991), Eric Raymond notes: 'Much AI-hacker jargon derives from ITS folklore, and to have been "an ITS hacker" qualifies one instantly as an old-timer of the most venerable sort. After about 1982, most actual work was shifted to newer

machines, with the remaining ITS boxes run essentially as a hobby and service to the hacker community.' One can almost see the figure of Stallman, with his long hair and bushy beard, peering out between these lines. However, the book's secondary definition of ITS is: 'A mythical image of operating system perfection worshipped by a bizarre, fervent retro-cult of old-time hackers and ex-users.' Apparently, some ITS supporters tried to wage a holy war against the incoming barbarians wielding Unix, much as Apple Macintosh users tried to fight off Microsoft Windows. As we know, however, Stallman moved on to try to create an 'open' version of Unix, one that would offer hackers the same source code accessibility as ITS.

The essential point is if you write your own programs, you can change them in any way you like, improve them on a daily basis, and share your improvements and enhancements

with friends. (Or, if you can't write programs, you can hire a hacker to do it for you.) But once you start buying in someone else's code, you can't change it easily – if at all – and you have to wait for your supplier to release updated versions.

Anyway, back inside the AI Lab, reactions to these dramatic changes varied. Some hackers went commercial and some stayed. Stallman says, 'It was very discouraging to those of us who wanted a community, to see that so many people thought they would benefit by not participating in the community. We felt we had been betrayed by them, but there was nothing we could do.' But there was something he could do, and that was to create a free operating system. And by doing that, he hoped to recreate the community to which he'd been so loyal.

### Community values

'What I realised was that you must have free software in order to have such a community: it can't be based on proprietary software, because with proprietary software, community is illegal,' he says. In other words, if you give your friends and neighbours copies of your favourite programs, it isn't sharing, it's software piracy, or theft. 'Making community illegal is the evil in proprietary software: anything that makes community illegal is monstrous. In the case of people who use software, community means you can help each other by sharing software, and changing software for each other.' However, Stallman reasoned: 'the existence of a free operating system would make both community available to people as an abstract possibility and enable the growth of a specific community that I and other people could then be part of.'

The first thing he did, in January 1984, was resign from MIT, so that the university wouldn't be in a position to interfere with his plans. However, there's no suggestion that this would have been the case anyway, and MIT still allows Stallman to have an office there, 'sort of for old time's sake,' he says. He then started work on the GNU project by developing a GNU version of his text editing program, Emacs (Editing Macros), which had originally been written for ITS. Its heritage shows through even today, because it's the only text editor to include an entire Lisp system to allow users to write their own editing commands. While Emacs has been ported to run on a very wide variety of computers, it has proved to be most popular on Unix systems, where it challenged the simpler and much smaller vi (pronounced vee-eye, from visual interface) written by one of the co-founders of Sun Microsystems, Bill Joy.

Stallman wanted to release Emacs complete with its source code, so that other hackers would be able to fix any bugs they found, add features, port it to different computers or otherwise improve the usefulness of the program. However, at the same time, he didn't want Emacs to be left without some form of copyright protection, because he knew that it could be misused. The solution, devised with the help of a lawyer, was a new licence commonly known as 'copyleft'. This was originally written for Emacs, adapted to cover all GNU programs, and some years later became widely used by other programmers as GPL (General Public Licence).

Stallman now had a program, a licence and a strategy, but he needed to bring more hackers into the project and raise money to support it. In October 1985, therefore,

he launched the Free Software Foundation to act as an umbrella organisation. It's still going. 'We get money in three, roughly equal ways: donations, sales of printed copies of free manuals or CD-ROMs of software, and deluxe distribution,' which means building a version of the operating system 'for your choice of platform', says Stallman. The next few years were very productive, with Stallman developing code for the GNU Debugger (GDB) and C language (GCC). However, while the ultimate aim was to create a complete, free operating system, the idea wasn't for GNU to produce absolutely everything, still less for Stallman to write it all himself.

'In order to make a system, we needed a whole bunch of components, and if there was something already available that was good enough, we used it, otherwise we wrote something ourselves,' he says. That means there's a difference between GNU software (which was written for the GNU system) and the much larger GNU system (which includes programs from many different sources). 'For example, TeX [Donald Knuth's text formatting and typesetting software, pronounced 'tech'] is part of the GNU system but it isn't GNU software. Knuth had already written it before there was a GNU project,' Stallman explains. The X Window system, written at MIT, is another example of software that's part of the GNU system without being GNU software.

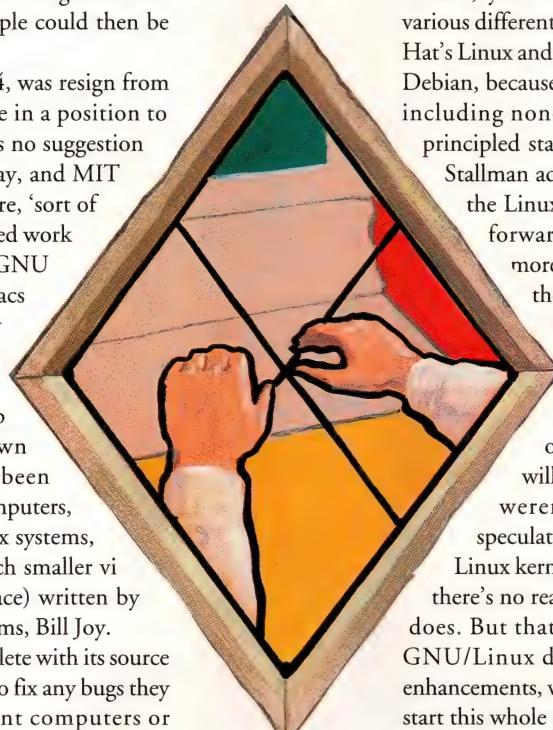
So who decides what goes into the GNU system?

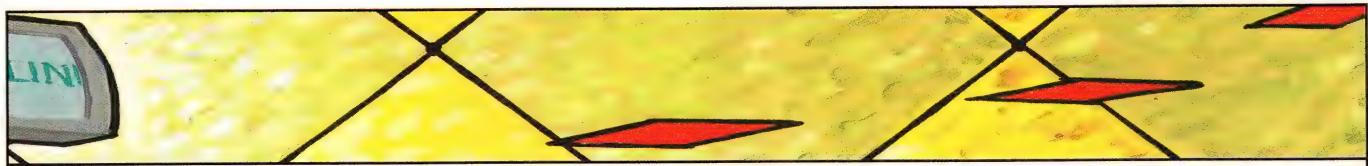
'I do,' says Stallman. 'But because it's free software, anyone can make their own version if they want to. In your version, you decide what's in it!' This accounts for the various different 'distributions' of the system, including Red Hat's Linux and Debian's GNU/Linux. 'The one we prefer is Debian, because it has the firmest principled policy against including non-free software. But Red Hat has taken a principled stand, so it's better than most of the others,'

Stallman adds. As well as GNU-type systems based on the Linux operating system kernel, we can also look forward to versions based on GNU's somewhat more advanced kernel, Hurd, when it completes the beta testing it started in 1996. So if Red Hat were to produce a distribution based on Hurd, would it still be called Linux?

Stallman laughs. 'If Red Hat is willing to call the GNU system Linux just because one program in it is Linux, maybe it would be willing to call it Linux even if one program in it weren't Linux! Who knows? But that's just speculation: I don't know what it will do.' Since the Linux kernel was released as a GPL program, of course, there's no reason not to support and use it – as Stallman does. But that's not true of all the programs in all the GNU/Linux distributions. Some include proprietary enhancements, which is a real problem for Stallman. 'I didn't start this whole project just because it would be fun to write the thing,' he says. 'The goal was to give a lot of people freedom. Already, a lot of people are using it, and many of them are thereby having freedom... but not all, because some of them are using the hybrid versions like SuSe which include non-free software. Those people don't have freedom. Here we see people who haven't learned to value freedom choosing to buckle on a few chains just to have some extra features. I think that's a terrible step backwards.'

It's a tough approach, but Stallman argues that it was this ethical and philosophical commitment to free software alone that motivated the GNU project to try to produce a





## FREE SOFTWARE: A TIMELINE

**1969** – Ken Thompson starts to develop Unix, an interactive time-sharing operating system, at AT&T's Bell Labs, the original intention being to play games on a DEC PDP-7 minicomputer.

**1971** – Richard Stallman joins the Artificial Intelligence Laboratory at the Massachusetts Institute of Technology (MIT) in Cambridge, Massachusetts. His job is to improve the Lab's operating system, ITS (Incompatible Time-Sharing System).

**1972–74** – Thompson and Dennis Ritchie, the inventor of the C language, re-implement Unix in C, making it the first portable operating system: it can run on any computer for which there is a C language compiler.

**1975** – Stallman develops a powerful word processor, Emacs (Editing Macros), for ITS.

**1984** – Stallman resigns from MIT to start the GNU project to write a free, Unix-like operating system. Following the Lab's recursive naming tradition, GNU stands for GNU's Not Unix.

**1985** – Stallman publishes GNU Emacs and launches the Free Software Foundation (FSF) to raise money to support the GNU project.

**1989** – The FSF introduces a General Public Licence (GPL) under which the source code of copyright software can be published. GPL is also known as 'copyleft'.

**1990** – As founder of the FSF and president of the League for

Programming Freedom, Stallman is awarded a \$US240,000 fellowship by the John D and Catherine T MacArthur Foundation.

**1991** – The Association for Computing Machinery presents Stallman with the Grace Hopper Award for developing Emacs. At the University of Helsinki in Finland, Linus Benedict Torvalds begins to develop the kernel or core of a Unix-like operating system, Linux, using the GNU C compiler.

**1994** – Torvalds officially releases the Linux version 1 kernel. It attracts about 500,000 users.

**1995** – Apache version 1 Web server software released. Apache ('a patchy server') is being developed co-operatively over the Internet.

**1996** – Stallman is awarded an honorary doctorate by the Royal Institute of Technology, Sweden.

**1997** – Eric Raymond, a GNU hacker, delivers a paper entitled *The Cathedral and The Bazaar* at the Linux Kongress 97 conference. It attracts widespread attention and at least one parody, *The Circus Midget and the Fossilized Dinosaur Turd*.

**1998** – After consulting Raymond, Netscape announces that it will release the source code for its Navigator Web browser. This persuades Raymond to found the Open Source Initiative, which will try to appeal to the business world. Both Stallman and Torvalds are given Pioneer awards by America's Electronic Frontier Foundation. Linux, or GNU/Linux, has at least 7.5 million users.

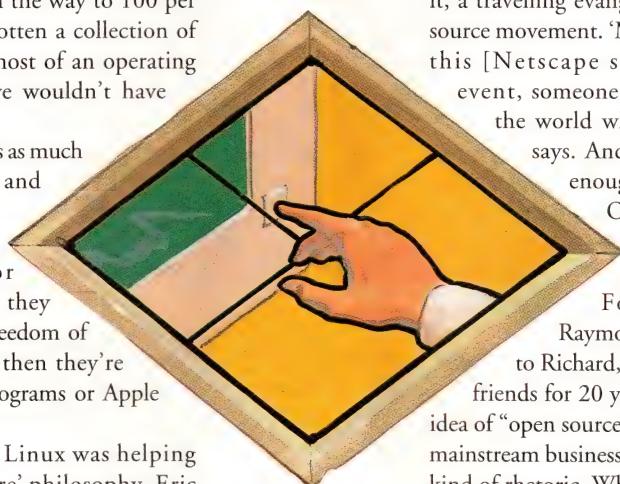
complete Unix-compatible free operating system. From Stallman's point of view, 'once there's one proprietary program on your machine, you're not entirely free, so anything less than 100 per cent free software is unsatisfactory. People with different viewpoints might conceivably have written many of these [GNU] programs, but they wouldn't have said 'anything less than 100 per cent is unfinished: we've got to get all the way to 100 per cent'. So we might eventually have gotten a collection of programs that could have made up most of an operating system, and which were free, but we wouldn't have gotten where we did.'

The problem is that not everyone cares as much about free software as Stallman does, and most ordinary users – who aren't hackers or even amateur programmers – are unwilling to make sacrifices for this particular type of freedom. If they can't be bothered about things like freedom of speech, or the freedom of the press, then they're unlikely to give up their Windows programs or Apple Macintoshes just to enjoy free software.

While the growing popularity of Linux was helping Stallman to promote his 'free software' philosophy, Eric Raymond, one of the hackers who had contributed most to the GNU project, was launching the Open Source Initiative

to promote the use of the term 'open source' rather than 'free'. Raymond, a self-proclaimed 'neo-pagan libertarian', martial arts expert and science fiction fan, came to fame when one of his papers (*The Cathedral and the Bazaar*, delivered at a Linux conference) inspired Netscape to publish the source code of its Navigator Web browser last year. This gave Raymond the chance to become, as he puts it, a travelling evangelist and carnival barker for the open source movement. 'My thought was that in order to prevent this [Netscape success] being a fluke, a one-off event, someone needed to go out there and explain to the world why they needed to pay attention,' he says. And if a hacker wants a job doing badly enough, he'll do it himself.

On the way to open source, of course, Raymond dumped Stallman's philosophy and the Free Software Foundation's intellectual baggage. Raymond says: 'Some people think I'm hostile to Richard, but I'm not – we're friends, we've been friends for 20 years. But when you're trying to sell the idea of "open source" to people who aren't hackers, who are mainstream business people, then you have to use a different kind of rhetoric. When you're selling it to hackers – people who are fundamentally intellectuals and idealists – then maybe it works to go on grand moral crusades and say that



intellectual property [in software] is evil and so on. Your average businessman doesn't want to hear that. He wants to hear, "Will it increase my profitability and reduce my downtime?", so that's the right thing to be talking about.

'What we need to focus on is good engineering outcomes: what produces the best software? If we can win on that level, any moral crusades will work out the way we want them to. If we can't win on that level then we don't deserve to win any moral crusades.' Put crudely, the difference between the two sides is that they both want good free software, but Stallman would rather it were free than good, whereas for Raymond the reverse is true.

### Open hostility

When I interviewed Stallman, he seemed somewhat hostile to the open source movement. 'Please make it very clear in your article that I have nothing to do with open source,' he said. 'I don't describe what I do as open source: that term is a mistake.' However, anything that qualifies as free software in Stallman's terms must logically be open source as well. Of course, Stallman has always had his own terminological problems because, as he admits: 'People might think free software refers to money, which isn't what we want.' Stallman isn't against charging for things, especially if it makes money that can be ploughed back into free software. Nonetheless, Stallman thinks that using the term open source is unlikely to prove any less confusing in the long run. For a start, there are lots of programs where the source code is available, but they aren't free in his sense of the word, nor are they open source.

'In fact, I suspect that the term open source will turn out to be more open to abuse than free. A big software company might well contemplate publishing the source code of an expensive proprietary program in order to benefit from the favourable associations with open-source software and the chance of some free bug fixes, whereas it would never risk announcing that it was free. That would tell too many people they no longer need to pay for it. Whether or not that's the case, as Stallman says: 'The naive meaning of the term open source is that the source [code] is published: you can see it. That isn't the official definition the term has been given.'

'It's a matter of terminology, and what we say makes a difference, but there's a difference between an issue of terminology and an issue of action,' Stallman says. 'The category of open-source software is so far entirely co-terminus with the category of free software: no-one has yet found a case that falls into one set and not the other. So there's no difference between free software and open-source software, but there's a difference between the meanings of the two terms [even though] we need not see a conflict in terms of what software we use.'

'In other words, although free software and open-source software describe the same category of software, they say different things about it. I use the term free software because it says what I want to say. Not perfectly, but at least it does so with some effectiveness, whereas open source doesn't say it at all... Open source eliminates what I consider the crucial, ethical issue here: that it's about how society ought to be structured, about what society needs, about encouraging people to co-operate with one another. That's all been taken out. With so many other people *not* conveying this message, it's especially important that I do so. So at every opportunity,

I'm bringing up this ethical issue of free software versus divide and conquer software.'

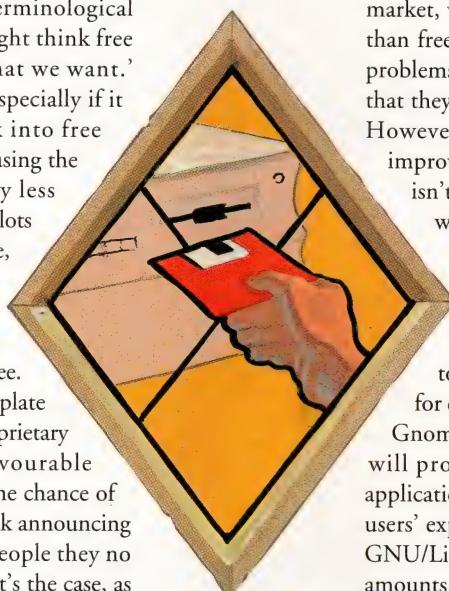
'It's no use just writing [free] software if we don't explain to people why you should do it. [If you] have a community which people belong to but who don't have an idea that there's an important reason for belonging, it's likely to blow away in the next wind. The only way the community can have a long-term foundation is if that foundation consists of people who value their freedom, and who are determined to keep their freedom, and who won't let it go. The term open source doesn't suggest or even hint that such an attitude would be possible. It doesn't even suggest that there's an issue of freedom at stake. So my focus is on raising that issue, and hoping [that people] will agree with me that freedom [to modify and redistribute software] is important – then they will make sacrifices when necessary to keep it. If people have freedom and they don't value it, they're likely to give it up.'

### What's the price of freedom?

It's hard to see that argument cutting much ice in the mass market, where ease of use seems to be valued more highly than freedom or reliability. And one of the more obvious problems with programs written by hackers for hackers is that they tend to be beyond the grasp of ordinary mortals. However, Stallman thinks matters should soon start to improve. 'The main reason why the GNU/Linux system isn't very easy to use is that it's an imitation of Unix, which is exactly what it was designed to be: it's as easy to use as Unix!' Stallman exclaims. 'But there's a major effort now to make it easier with Gnome, the GNU desktop project, which has been receiving funding from Red Hat. The goal is to provide a coherent set of graphical user interfaces for doing basically everything.'

Gnome (GNU Network Object Model Environment) will provide a free and complete set of user-friendly applications and desktop tools that will meet with today's users' expectations. However, even if they have the tools, GNU/Linux programmers are still without access to the vast amounts of market research and the usability labs that have become the software equivalent of wind tunnels. Stallman says: 'We have a different approach, a more evolutionary approach: try doing it one way, and if people aren't happy with that, change it.' To anyone used to the rapid pace set by companies like Microsoft, this approach seems terribly slow. But Stallman doesn't believe this is necessarily true, and even if it is slow, it doesn't matter all that much.

'So what if it's not lickety-split. So what if it takes a few years,' Stallman says. 'You're going to live a few years. I've been working on this for 15! Remember, we started from almost nothing. We're catching up. We'll get there...' ☀



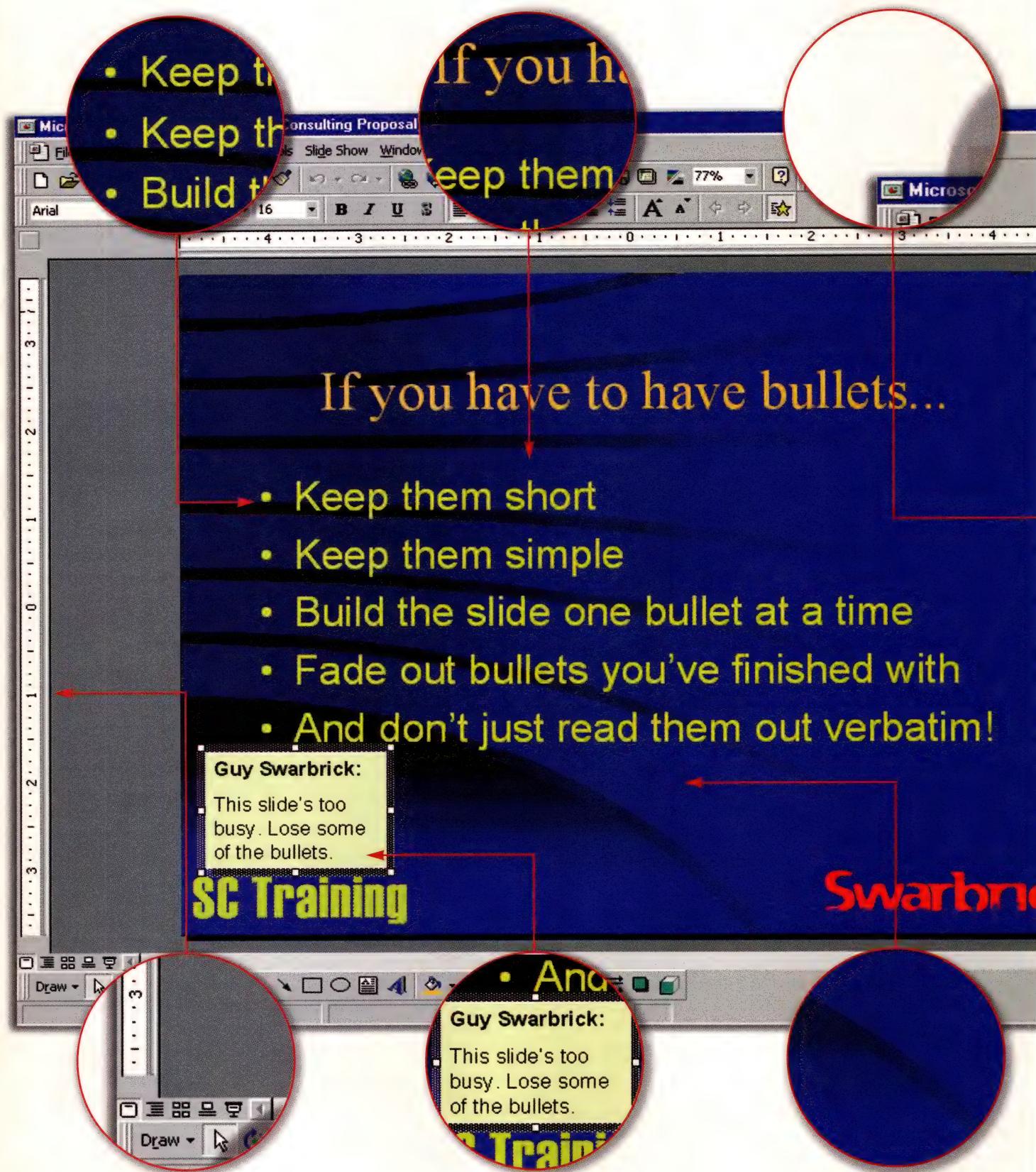
## BIOGRAPHY

Jack Schofield spent the 1970s editing photographic magazines. Then, in the 1980s, he edited *Practical Computing in the UK* and wrote a weekly newspaper column. He has since edited and contributed to a range of IT publications.

• Bulleted slides can be effective if you follow a few simple rules.

• Two is the maximum number of fonts for a slide or presentation.

• Toolbars don't have to be added to the top or bottom of the screen.



• Rulers are handy when formatting bulleted text but can be removed to view more of the slide.

• Comments let you add notes to yourself or allow teams to collaborate in the production of slides.

• The blue pulses in this template are animated during a slideshow.

# POWERPOINT 97 MASTER CLASS

HAS ANYONE EVER FALLEN ASLEEP DURING ONE OF YOUR SLIDESHOWS?  
LEARN THE TRICKS OF SUCCESSFUL PRESENTATIONS WITH GUY SWARBRICK.

Often, the only difference between a hero and a villain is your own point of view. Among mainstream software packages, Microsoft's PowerPoint has the unusual distinction of having the potential to turn all of us into heroes, yet so often it turns us into villains. When the Navy first struggled to teach me the arcane art of presentation, it warned me of one thing above all others. In those days it was called 'death by overhead' or 'death by acetate', now it's dubbed 'death by PowerPoint'.

It's true that few of us can carry an audience for any length of time with just our personalities and tone of voice. Complex, technical subjects often need illustration, and good use of visuals can make the most ordinary of subjects come alive. However, slides are no substitute for good presentation skills.

There are, of course, worse forms of torture than a two-hour presentation of 200 text-dense, bullet-point-heavy slides, but it rarely seems like it at the time. I even worked for one company where the 'bullet culture' was so pervasive that it became the norm to set PowerPoint up so that the slides were in portrait orientation – that way, more bullets could be accommodated. The problem isn't PowerPoint, it's the way it's used. PowerPoint is a tool to enhance your message, not a crutch to help you remember it, nor an excuse to avoid articulating it.

#### Art of presentation

To help explain how to use PowerPoint as an effective presentation tool, I'm going to take a fictitious example: your company, SC Training, has been asked to provide tuition in presentation skills for a consulting firm. The firm's needs have already been determined but, before the training can be delivered, SC Training has to present its ideas to half a dozen of the consultants. The company has also asked for a presentation on 'the art of presentation' to 60 of its customers at its annual client day. Finally, of

course, the training itself has to be designed and delivered. SC Training is using PowerPoint for all three parts of the process, but in a number of different ways.

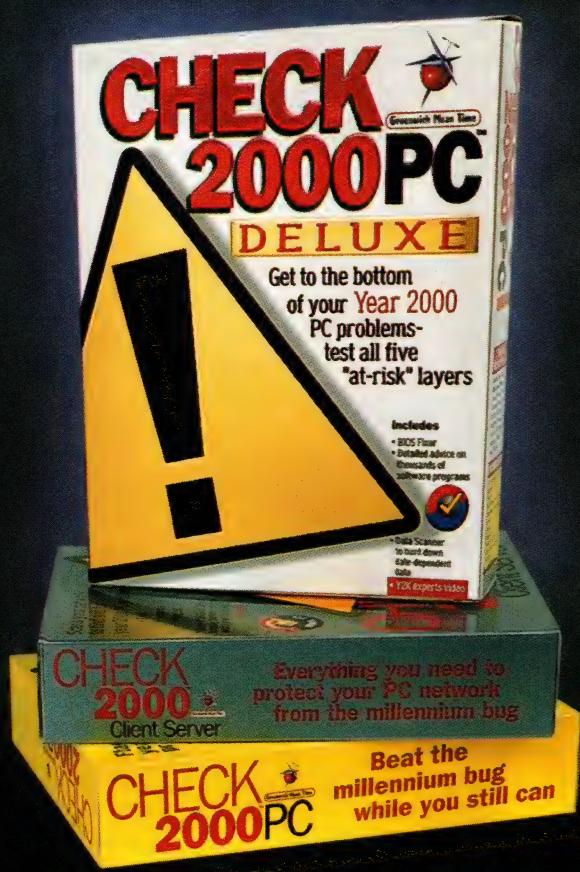
This article will concentrate on tackling the presentation for the consultants. The technique for producing the training slides is much the same, although the handouts will be different. I'll come to those later. The consultants are busy people, so you want to keep things short and snappy. As with all presentations, the first and most important thing to think about is structure.

The classic litany of presentations is simple: tell them what you're going to tell them, tell them and then tell them what you've just told them. Largely, this is accurate, but you can be more subtle. SC Training has a simple set of guidelines.

The first thing you need to determine is your objective: what's the presentation for? In this case, you want these highly experienced consultants to agree to the curriculum for your training course and to become advocates for the course within the firm. You're not going to tell them what your objective is – at least, not directly – but unless you understand it yourself you'll never know if the presentation was a success. Next, you need to determine the message you'll use to get to your objective. What is it you're trying to say? You may have multiple messages, which is fine, but your audience will struggle to remember more than three. Don't try to leave them with more than that. Once you've determined what your key messages are, ask yourself: 'If the audience took away only one thing from my presentation, what would I want it to be?' You should build the presentation around that message.

There are three messages for your training course. First, the course is going to give them the skills they need to do their jobs. You know what those skills are because you've spent a lot of time talking to the consultants prior to designing the course. But the presentation needs to make it clear that you were listening. Second, you know how important it is that you measure the success of the training.

## 1970'S BUG CATCHER



## Y2K'S BUG CATCHER

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Part of the course will be a toolkit, built using PowerPoint, which allows the firm to monitor the improved effectiveness of its presentations over time. The last part is the key message. The best form of presentation training is doing presentations. The audience are all experienced presenters and you want them to know that you value their experience, which you'll encourage them to share with the others on the course through a series of real presentations and workshops.

Now you know what will form the body of your presentation. Next you need something to grab their attention – the hook. A hook's important because people typically remember the beginning and end of a presentation. The more effectively you can grab them at the start, the further into the body you're going to be able to cling on to their inevitably declining attention. You need to get the audience involved. Ask for a show of hands. Ask people to stand up. Get them involved again at least every 20-25 minutes, or you'll lose them. In this example, you've found a wonderful statistic showing that people's number one fear is not death but public speaking. Death was sixth.

There's one last thing to do before you succumb to the inevitable and launch PowerPoint. You need to think about how you'll get your messages across – what you're actually going to say and put on the slides. SC Training tends to use paper to construct everything from simple lists or storyboards to elaborate mind maps. I use a software mind-mapping tool called The Mind Manager. It's possible to use PowerPoint, but the tendency is to call up a blank slide and start typing. The result, invariably, is more bullets than in the first 30 minutes of *Saving Private Ryan*. If you must use PowerPoint, try to pull the structure together using the Outline view. Do this in multiple passes, until you know what the key slides are likely to be about. The first pass, for example, might lay down the basic headings for each of the messages and some structural signposts.

Don't get too attached to the wording you use as you build the structure. It's very unlikely you'll end up using what you're building now as slides. What you'll have is a series of placeholders, every one of which may become one



**Make the slide a trigger for your message, rather than the message itself.**

or even half a dozen slides in the final presentation. Keep passing through the outline, adding new lines between your placeholders, until you're happy that you've got all – or at least most – of the slides you're going to need.

There are some simple but effective tricks to make things look as slick

as possible with the minimum of effort when it comes to pulling the presentation together. But that's for later. In fact, the appearance of the slides is left to last because PowerPoint positively encourages fiddling. If you're going to achieve your objectives, you need to invest the bulk of your time in putting together the content. Don't worry about the fact that PowerPoint tries to force you to start with a template.

So, finally, you get to the slides themselves. There are no hard and fast rules for the right number of slides per presentation, bullets per slide or words per bullet. I've moved, over the years, from respective average scores for these three categories of 60, ten and 20 for a one-hour presentation, to a record of six, none and under ten words per slide. I try to keep within the limits of one slide per four or five minutes of presentation, six bullets on any one slide, a total of two or three slides with bullets, and bullet points that are no more than one line long. If I stepped outside any of these boundaries, I'd question not just my approach to the presentation but whether, in fact, a presentation was the right medium.

### Basic slide techniques

I know it's a cliché, but KISS (keep it simple, stupid) is a useful mantra. Once again, the purpose of a slide is to enhance your message, not to deliver it in its entirety, or to detract from it. Choose one or, at most, two clear fonts and

- Keep them simple
- Build the slide one bullet at a time

## PRESENTATION HINTS AND TIPS

- 1 Keep the slides simple. Bullet slides are sometimes unavoidable, but limit both the number and complexity of bullets on each slide.
- 2 Building a slide can be very powerful, but always use builds to tell a story, not to show how good you are at using PowerPoint.
- 3 Use animation and audio sparingly and creatively. Don't allow them to distract your audience from the message.
- 4 Remember that video and audio can take a long time to load before they start playing. Use short clips where possible and use rehearsals to ensure any unavoidable pauses aren't 'pregnant'.
- 5 To position a single item precisely without turning off Snap to Guides, hold the Alt key while dragging the object.
- 6 In normal views, slides leave large, unused areas at the sides of the screen. Use them productively by adding frequently used toolbars to the sides of the window rather than to the top or bottom.
- 7 Don't create multiple versions of the same presentation. Build one

master and use Custom Shows to tailor the content to different audiences.

- 8 Print out Notes Pages for rehearsals, but avoid using them during the live presentation.
- 9 Get a good feel for the length of your presentation using the Rehearse Timings feature. It will tell you how long each individual slide was displayed, as well as the overall length of the presentation. Also, if you're up to it, it can be used to automate the slide transitions.
- 10 Use slides as slides and create separate handouts. Distribute the handouts after the presentation. Put as much effort into your handouts and other materials as you do into your slides.
- 11 PowerPoint presentations can be added to Web pages by selecting Save as HTML. The browser will need to have the PowerPoint animation viewer (built in to Internet Explorer) or a copy of Office to see the show. Whole slideshows can also be saved automatically as a series of GIFs, which is a great way to simplify the production of animated GIFs.

stick to them, using them consistently throughout the presentation. I tend to choose just one and use a regular style for bullets and the bold version for slide titles. Theory has it that serif fonts are easier to read on the printed page, but on slides you're looking for simplicity above all, so sans serif fonts usually give better results.

PowerPoint makes slide production easy, but there are a few guidelines worth remembering. Don't just take the default slide layout and butcher it until it fits. Think about what will be on the slide and choose the appropriate layout either by selecting New Slide from the Insert menu or by adding a default slide and changing the layout with Slide Layout from the Format menu. This is important because you want to maintain consistency with the slide template (of which more later) and PowerPoint can enforce this provided you follow its standard layouts. They work pretty well too, unless you need a lot of slides with tables. If you frequently use tables on slides, you may have picked up this article expecting to find 'the answer'. There is one, but unfortunately it's to upgrade to Office 2000, for which you'll have to wait a little while. Frankly, using lots of tables is not something I'd recommend (see the KISS rule above), although they're a perfectly acceptable addition to your PowerPoint-based printed report or handouts. If you do want to use them, resist using the Table slide layout.

Ironically, the problem with the Table slide layout is that it uses Word tables, which are almost universally accepted as one of the best features in Word 97. The problems are two fold, though. First, the inserted table is an embedded object, edited 'in place' by loading Word 'inside' PowerPoint. The result is clumsy and slow, even on the fastest of PCs. Second, the resulting object is hard to format. It can't be easily resized, and lines disappear. There are solutions for simple tables, but none of them are very neat. Perhaps the best trick is to think of each column of text as separate, entering it as a simple textbox. You can add lines to separate columns and delineate the outside of the table fairly easily by changing the attributes of the textbox. Horizontal lines – those delineating the rows in the table – essentially need to be added using the Line Draw tool. Horrible? Yes, it is.

Similar problems occur with that other slide favourite, the chart. Sadly, statistics do capture the imagination, and statistics shown as charts can be very powerful. The obvious method for adding them is to draw them in Excel and copy and paste them into PowerPoint. However, a simple paste will give you all the problems of tables and more. To avoid embedding the chart as an Excel object and to enable you to resize, recolour and enhance it, use Paste Special and paste it as a graphics object. Ungroup the object and you're away. Of course, the chart won't automatically update when you change the data in the spreadsheet, but your audience stands a greater chance of understanding its implications which, after all, is the point.

In contrast to tables and charts, adding still images couldn't be simpler. PowerPoint includes some useful automatic anti-aliasing technology which means that small images scale reasonably well. However, bullet slides, tables and images may not be enough to create the impact you're looking for.

### Audio and video

Sadly, it's possible to do something which no-one wants extremely well. So it is with PowerPoint sound effects. Yes, you can easily make text appear in the manner of – and with an authentic soundtrack from – a typewriter. There's no

good reason to do this though, which is a shame. Stock PowerPoint animations and sound effects have been overused to the point where people who should know better condemn both out of hand. Yet, with sensible use, audio and moving pictures can greatly increase the amount of material your audience retains.

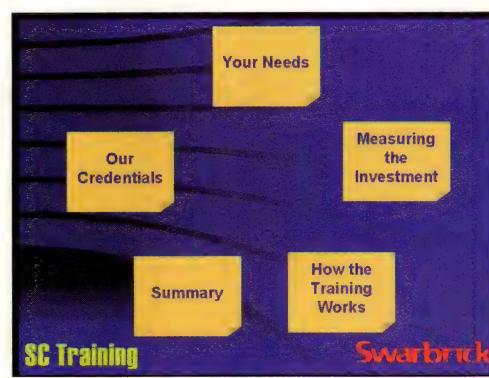
Let's start with motion. Slide builds are one of the key ways to enhance a presentation; they turn a simple organising framework into a compelling story and make even the maligned bullet slide a worthy addition to your slide deck. All this is in sharp contrast to slide transitions, which should almost always be avoided.

Let's start with a simple bullet slide. Type in your slide title and your four or five bullets, trying wherever possible to avoid anything that goes over one line. If you creep over by a few characters, drop the point size but don't be tempted to use six point text just to meet the single-line rule. Now select the bulleted area, right-click the border and choose Custom Animation. First, go to the Timing tab and set the bullets to appear on a mouse click.

If you're really confident and well rehearsed, you can set a time for each bullet, which looks great since the bullets appear 'on demand' without your intervention. Personally, I've had too many unexpected interruptions over the years to be that brave. The next best thing is to have an unseen accomplice click the mouse. With practice, it's at least as slick as setting timings and much safer.

On the Effects tab, have the text Fly from the left and set the text to be introduced All At Once. Also Dim the text after it's been displayed. This is important. The reason for using a build here in the first place is to discourage people from reading ahead and not listening to what you're saying. Similarly, dimming the previous bullets keeps people focused on the subject at hand.

Equally effective is a graphical framework for your presentation, highlighting the current section as you move through the presentation. Often, you'll want to show the



By repeating the organisational framework for the presentation at key points, and building it step by step, the structure of the presentation is reinforced.

whole framework and highlight the current section by altering the colours. However, you may want to start with one element and, as you move through the presentation, introduce the additional elements with restrained animations. In this example, you might fly the first element in from top left, the second from the top, the third from top right, and so on. Or you can build a compelling story using a chart. Show the picture as it is now, then add your prediction. Have the predicted performance line – a separate graphical object if you've followed the instructions earlier – Wipe right (or up) and the image will appear to be 'drawn' onto the existing chart.

Audio's a little more difficult. First, sound effects are usually more annoying than effective. Second, sound and video clips can be large, and the pause before your attention-grabber between you clicking the mouse and the clip loading may lose all the intended effect. A good use of PowerPoint's audio and video capabilities is to pull together what would be a sophisticated multisource. Don't just include the text of a quote from a customer; include the quote itself. Add a



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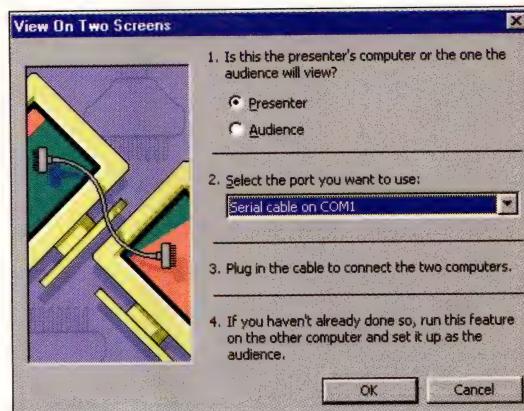
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video clip.

If you feel you need a script, PowerPoint's Slide Notes are a useful feature. Using a print-out of the slides with the notes attached is great for rehearsals but should be avoided during the actual presentation. It ties you to the spot where the slides are, and turning the pages is clumsy, noisy and very obvious to your audience. It's too easy for your script and your slides to get out of sync and, if you've done your slides well, there's going to be a lot of script for each slide.

There is an alternative if you have access to two PCs, or if you're using a Windows CE handheld device (or acetates, of course). You can view your Slide Notes on your screen and have the slides appear on the projector. You'll need a null modem cable to connect the serial port of the presenter's machine to the serial port of the PC connected to the projector, or even, for small groups, a large monitor. Choose View On Two Screens from the Slide Show menu and you'll be given a dialog that allows you to select the right serial port and to set one PC up as the Presenter and one as the Audience. Now, essentially, the Audience PC will show the slides while the Presenter's machine can have slides, Slide Notes and even PowerPoint's admittedly not very useful Meeting Minder function running without



You can use one PC to display the slides for the audience and another for your notes.

the audience seeing it.

Better still is to be so comfortable with your material that you don't need a script at all. Whatever you do though, don't 'talk' the slides. By using your slides as a script substitute, you only bore the audience and it makes you look halting and unprofessional, no

matter how well you know your subject. It also constrains you too rigidly to the order and structure of the slides. Tom Peters, management guru and presenter extraordinaire, counsels: 'Do it right first time is insane advice. Nobody does anything halfway interesting the first time.' Audiences vary, circumstances change; the more you build into your slides, the less opportunity you have to adapt to their needs during the presentation. There's also no need to worry – let alone apologise – if you forget something. The

lining

Swarbrick

## COME THE BIG DAY...

It doesn't matter how good the content of your PowerPoint file is if everything goes pear-shaped when it comes to making the presentation. This isn't really the place for a course in presentation skills, but if you stick to the three Rs – relax, relate to your audience and rehearse – you'll be fine.

You don't have enough time to rehearse properly, of course. Neither do I. Or, at least, I didn't. For years I would tell myself and numerous conference and event organisers that my 'gift' was spontaneity and that rehearsal just took the edge off my performances. This was true to a certain extent, but I was also in the position of having to repeat many of my presentations, often a dozen or more times. They were never the same, of course. I'd work in topical references, relate to the audience and adjust content and timing to suit the circumstances. I'd tell people that, far from being boring, repetition improved my act. Indeed, I rarely gave my best performance until about the third or fourth time.

Gradually, it dawned on me. If I rehearsed a couple of times I'd be giving my best performances from day one. For most of us, presentations are a one-off event, so you have to make the time. If you can, find a constructively critical audience; if you can't, try doing the presentation to a tape recorder. It may feel daft, but it will almost always sound better when you play it back than it felt when you were doing it. It's a great confidence booster and a good way of honing the content and the timing. Best of all, if you've rehearsed well, you should never suffer the embarrassment of putting up the next slide only to have to apologise to the audience and admit you've already covered the material it contains.

Believe me, if you follow the simple rules in this master class, you'll reduce the time you spend producing PowerPoint slides so much that you'll have plenty of time to rehearse. And the more you rehearse, the more relaxed you'll be. The more relaxed you are, the easier you'll find it is to relate to your audience. Try to arrive at least a couple of hours before the programme, not just your presentation, is due to begin. If possible, visit the venue in advance. For formal conferences or seminars,

the night before is ideal so you can check out the layout of the room.

If, like me, you hate using a lectern, make sure the organisers know in advance. I wander all over the place so, if a room's set up with a single fixed spotlight and a microphone on the lectern, I'm uncomfortable the whole way through – and it shows. Insist on a radio mike and adequate lighting. Even if the presentation is being done semi-formally to a group of people in a company meeting room, make sure you know there will be a projector and where the light switches and the power points are. If in doubt, take your own projector. Check your equipment works with the equipment at the venue. Large venues will use sophisticated projectors which are likely to accommodate any video mode you throw at them, but they need to be set up in advance to do so. Older LCD projectors are likely to be restricted to 800 x 600 or even 640 x 480, so make sure you know the specification and are confident your slides will look good on the equipment you're going to use. It isn't just resolution that's important; colour combinations that look great on your monitor in the office may not work at all on a projector or printed out on a black and white laser printer.

The last thing to remember is always to take a backup. I often take an LCD projector, even when the host of the meeting has assured me one will be present. I still, occasionally, take coloured acetates with me and have been known to lug an overhead projector to a venue I've had problems with in the past. One major semi-conductor company still produces all its slides as acetates in order to be as flexible as possible. There are other reasons why acetates may be appropriate. Good colour printers are capable of 1,440dpi, which equates to a slide resolution of around 1,500,000 x 1,100,000, rather than the paltry 1,024 x 768 your PC will pump out. In general, though, use acetates only when you need to, as a supplement to the main presentation. If you need more detail than your PC can display, you probably shouldn't be using a slide anyway. And it's very difficult to animate acetates.

The devil, as always, is in the details. Prepare well and you can enjoy it.

audience doesn't know what you were planning to say, so just move on.

A final word on Slide Notes. In an ideal world, everyone would have the luxury of being able to produce a new, personalised presentation whenever the need arose. In practice, though, you're often asked to present a set of slides produced by someone else – either by accident or design. The more closely the rules outlined here have been adhered to, the less the slides will mean to someone who hasn't seen the presentation and the more important it is that the slides are accompanied by some sort of presenter's guide. At the very least, the key messages associated with each slide should be detailed in the Slide Notes.

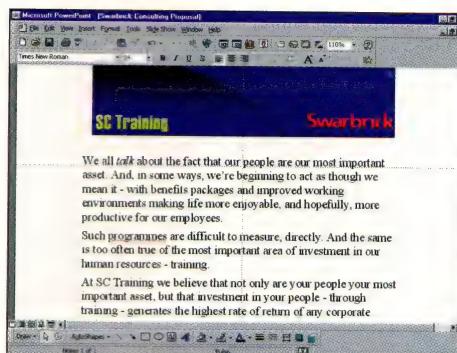
Now it's time to apply the finishing touches, such as choosing a template and making the whole thing look professional. The first thing is to ensure the audience knows the presentation was produced especially for them. It's a small thing, but an important one. Not so long ago, getting your customer's logo onto a slide was a major achievement. These days, a visit to the company's Web site and a bit of copying and pasting will usually do the trick, but the effect is the same now as it's always been.

Treat a company logo with respect. Try to incorporate it into your slides as sympathetically as possible. Don't stretch it to fit the hole in your template. PowerPoint's Picture toolbar contains some simple tools to clean it up, including the invaluable Transparency tool to remove the background and blend the logo and your slide. It won't always work, though, particularly if the slide background and the original image background colours are very different. The best option is to give the logo to an Adobe Photoshop user and get the job done properly. Selecting another template is preferable to dropping in a fuzzy logo. Of course, the logo, along with any other additions or changes to the template, should be added to the Slide Master. Either select it from the View menu or Shift-click the Slide icon. Once set up, you don't need to worry about font formats of text you've cut and pasted from other documents. Just throw it in and select Reapply on the Slide Layout dialog.

If you can afford it, it's worth getting a professional designer to produce your template; otherwise you'll almost certainly be better off using standard PowerPoint designs – either as they are or customised – than trying to create your own, at least early on. There are some clever techniques you can borrow, however. Take Microsoft's Pulse template, for example. As each slide is displayed, a fan of light blue shoots across the screen. It's an impressive effect, but creating it – although laborious – is simple. Hold down the Shift key and click the Slide icon to display the Slide Master, and all is revealed. The blue slide has a series of fan segments superimposed on it, each pair having a regular gap between them. A simple, thin blue block, the full height of the slide but placed on a layer behind the fan segments, sits at the right-hand side of the template. The bar is set to fly from the left when the slide is displayed but, of course, all we see is the parts of the bar that aren't obscured by the fan segments. The result is seven blue laser bolts tracing graceful arcs across the screen.

## Handouts

As I mentioned earlier, the mistake most people make is to produce slides that can be used as handouts. However, that doesn't mean that handouts aren't sometimes useful, or that PowerPoint isn't the right tool for producing handouts.



**Slide Notes allow other people to deliver your presentations should the need arise and are good for rehearsals.**

You should still aim to keep the slides clear and simple, but you can afford to put far more detail on a 600dpi laser-printed slide that will be read at the attendees' leisure than you could ever communicate during your presentation.

Just as it's worth putting in the effort to make the slides look professional and custom-produced for your

audience, so it makes sense to do the same for your handouts. An effective but under-used technique is to adopt a header and footer with page numbers, your company's and your client's logos and the presentation title. It's simple to do; select Master and then Handout Master from the View menu, or Shift-click the Outline View icon.

Think about how the handouts will be used when you're choosing how to print them. A common mistake is for people to print the slide set out as 'notes pages'. True, you get a nice layout with accompanying ruled sections for people to take notes. But the aim is for them to listen to you, not to flick ahead through the slides you've yet to present or to write their to-do lists. Avoid giving out handouts until after the presentation and try to produce them separately from the slides, adding tables, statistics and more detail to reinforce and further inform your message. Often, this means you won't be printing them as handouts at all, but as full page 'slides'.

## Getting the message

This has been an unconventional PC @uthority master class. PowerPoint has as much depth as most business apps, but a detailed knowledge of how the package works isn't the most urgent requirement for those struggling to understand why people still fall asleep in their presentations, despite them using the most popular and arguably most powerful tool on the market. Of course, that also means that the advice outlined here, for the most part, is as useful to users of Lotus Freelance or Corel Presentations as it is to the PowerPoint user. In other words, the medium is not the message. ☀

• **And don't just read t**

**Swarbrick:**

## BIOGRAPHY

Guy Swarbrick is a management consultant, an experienced presenter, a former Microsoft marketing manager and former magazine editor.

**SC Training**

## RESOURCES

Microsoft Office: [www.microsoft.com/office](http://www.microsoft.com/office)  
The Mind Manager: [www.mindman.com](http://www.mindman.com)

# THE NEW MUSIC

THE WEB'S INCREASING INFLUENCE IS FORCING THE MUSIC INDUSTRY TO MARCH TO A DIFFERENT TUNE.

For many performers firmly ensconced in the music industry, guitar solos and Jack Daniels are generally more synonymous with their traditional world than the emergence of new technologies such as the Internet. Shrouded in controversy, the rise of the Web from fringe network to mainstream communications tool promises to well and truly rock the music industry.

Beyond its networked value, the essence of the Web's influence lies in its ability to empower previously unknown technologies. Used for listening or producing music, it is unparalleled for its cost effectiveness. On a technological level, the Web can be used as a tool for real time broadcasts, compressed downloads via MPEG and MP3 (generally the Web's audio compression standard), and netcasting via realtime streaming technologies such as RealAudio and NetShow. Even remixing tracks through software downloads such as Cakewalk, Cubase, and Logic Audio are possible thanks to the Web.

The antics of archetypal pop star David Bowie serve as an excellent measure of the potential of the Web for the music industry. Halfway through a tour last year, he recorded a new track, 'Telling Lies', but had no time to compose a complete album. His record company, Virgin, refused to distribute a single only. As a result Bowie decided to release the track free on his Web site. Nearly 200,000 people came to his site in a few weeks to get the precious extract. Since then, Bowie took further interest in the Internet and is now a service provider.

Bowie's overt pledge to new technology is admirable, though the issue of acceptance becomes increasingly complex. Not only is the proliferation of technologies such as MP3 recognised as a threat by the major commercial entities, but on a more pragmatic level the issue of distribution and direct sales via the Web are also

sources of heated debate.

Since the beginning of the music industry, major record labels have generally been perceived as entities in ownership of distribution networks. This notion is being challenged through the proliferation of the Web. Now a label or artist of any size can sell its products worldwide through the Internet, meaning that reliance on conventional distribution methods practiced by the music industry come under question. This situation has also led to friction between major labels and distributors, with distributors' margins shrinking as labels begin selling products online. Neither party is under much threat - yet.

## Technology

Before delving into the technological complexity of web music, let's go back to square one. What does the home user need? Start with a Pentium MMX, PII or equivalent system equipped with around 32Mb, bare minimum. Next up you'll need a good quality wavetable soundcard and dedicated video capture card, for which you should expect to spend around \$250 for something from the likes of Yamaha, Creative Pacific or Diamond. From there it's a matter of obtaining Internet access and a modem, with 56K advisable for those anticipating the use of ISDN and improved on-line frame rates. Good quality speakers with a subwoofer can be obtained for around \$100.

Next up, sound compression is a key point worth acknowledging when it comes to online music. Free RealAudio compressors are readily available via the Internet, condensing file sizes for easy transfer. New compression formats, such as MP3 (MPEG 1, Audio Layer 3), squeeze music into files that can be downloaded off the Internet and stored on a PC hard drive.

An abbreviation of 'Motion-Picture-Experts Group, Audio Level 3,' MP3 is a compact way of storing high-quality music and sounds. MPEG has created a number of

Illustration: Design Foundry



This involves saving work as a MIDI file and matching it with an encoding and decoding program to enable the dispatch and reception of these MIDI files via email. Apps such as RealMedia, an extension of RealNetworks' RealAudio file format allows synchronised audio and MIDI data to be streamed from Internet sites. By utilising an MP3 encoder

methods for compressing digital video and audio, and MP3 is just one. If you have a DVD player or a small-dish satellite TV system, you've already been watching MPEG compressed video and listening to MPEG compressed audio.

The MPEG 1 Layer 3 algorithm is based on a very complicated psycho-acoustic model. This model has the capability of eliminating those frequencies which the human ear is unable to hear, therefore massively reducing file size.

Without MPEG compression, you would not be able to receive as many channels on your satellite receiver, and you wouldn't be able to get a two-hour movie on one side of a DVD. To put it in numbers, a two hour and 15 minute movie would take up 255 gigabytes if it were not compressed. Using MPEG compression, that size can be reduced by a factor of 50, so that same movie will fit in five gigabytes, small enough to put on a DVD.

In terms of audio files, one minute of uncompressed stereo audio takes up nearly nine megabytes. One minute of MP3 compressed stereo audio requires one megabyte or less. Transferring CD audio files directly to a computer's hard drive will often result in files of up to 45 megabytes in size. By utilising an MP3 'encoder' program, that 45Mb monster can be transformed into a slim 4Mb slice. This equates to a ratio of approximately 1:12, around ten times smaller than the original CD audio track it was encoded from.

MP3's efficiency and the fact that it is a free and open standard have made it the de facto for high quality digital music on the Internet. There are MP3 players available for nearly every type of computer, and there are hundreds, if not thousands of Web sites where you can download MP3 files.

Many have attributed the heightened profile of MP3 to Diamond Multimedia's Rio MP3 player. The Rio essentially takes the information stored on the PC and plays it back on a lightweight, portable device. Allowing mobile access to MP3 files, the Rio can hold up to 60 minutes of CD quality audio, running for hours on a single AA battery.

By using a standard 56k modem, a three minute song can be downloaded in MP3 format in just over ten minutes. Through using a high-speed Internet

connection, a cable modem or DSL connection that same song can be downloaded in about ten seconds.

At that speed, 74 minutes of CD listening can be downloaded in five minutes.

For CD to MP3 conversion, CD audio must first be converted to a WAV file. This is done in a digital method, and the quality of the result depends heavily on the capacity of a soundcard's 'analog to digital converter'. For playing MP3s, you need a player, for creating MP3s, you need a ripper and an encoder. Available as free downloadable utilities via the Web, CD Rippers are programs that 'rip' a

track off of a CD, converting it digitally.

A player, encoder and ripper can be downloaded separately from the Web, or all in one program such as Musicmatch For Windows. Alternatively, there are many players available as shareware from sites such as [www.mp3.com](http://www.mp3.com).

Installing a new player is simply a matter of downloading it and running the installer or setup file. A new MP3 player should then be set as a computer's default player. This tells the computer to automatically load the MP3 player whenever an MP3 file is played.

Many smaller artists and artists on independent record labels have discovered that having MP3 files of their music available for download is a great promotional tool. Some major artists have even released songs as MP3 only, not available on cassette or CD. On the opposite end of the scale, MP3 has been the cause of much grief for many major labels as they see it as a big threat to potential revenue.

In terms of music creation, beyond prophetic MP3, a number of software packages are available that can remix existing work. This involves saving work as a MIDI file and matching it with an encoding and

decoding program to enable the dispatch and reception of these MIDI files via email. Apps such as RealMedia, an extension of RealNetworks' RealAudio file format allows synchronized audio and MIDI data to be streamed from Internet sites.

As far as mixing is concerned, Cakewalk's own DirectX audio plug-ins for Reverb and Chorus, the two most-requested audio effects from Cakewalk Home Studio users eliminate the need for costly digital sound processing units, allowing modular expansion into only those features the user wants.

While most production sites are purchase only, many can be found as freeware on the Web, buried in a host of well concealed sites.

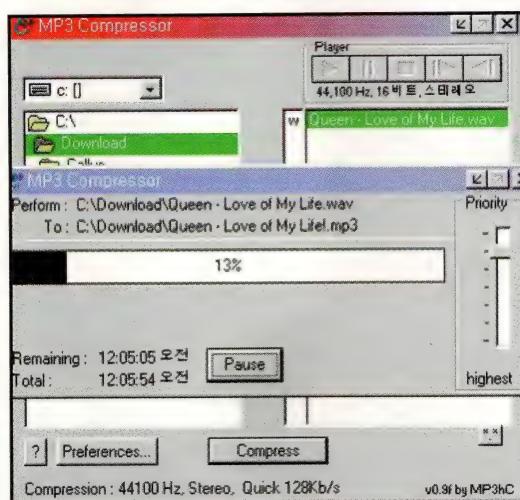
### Industry players

Having gleaned comment from many commercial music entities, from netcasting specialists and FM radio executives, record company A&R heads and even magazine publishers, it's

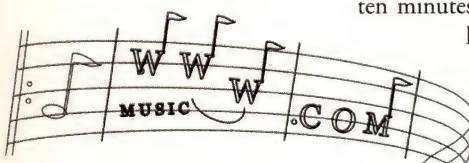


obvious that many still see the Web from a distance. It is, in their eyes, not a vital technology as such, but an adjunct to existing promotional patterns, a tool seated somewhere between magazine adverts and free soft drink samples.

Craig Camber, A&R (artists and repertoire) chief at Warner music, believes the Internet is still an underdeveloped medium,



A range of features are available from CD to MP3 conversion. Audio grabber can be found at <http://mp3-2000.com>



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and as yet has failed to really affect established methods. 'I think there is room for independent bands to release their own material over the Internet, though I think if they want international representation plus all the peripheral services a major label can provide, such as strong management, marketing budgets and publicity and the capacity to sell five million records throughout the world, then they will stick with the conventional methods. Internet technology is great, though as yet it has had little impact here; for a niche market it will be fine, it all fits into the DIY ethic and that's great, though it won't replace the major record labels just yet.'

On the other side of the scale, many involved in the process of production see the Web as capable of wielding far greater influence. According to Kelly Gardener, executive producer with Sidewalk, NineMSN's music and entertainment site, the Web provides an impressive communications link. 'It offers audiences and producers of music alike a means to get in touch with one another, where they may not be able to do this using conventional media.'

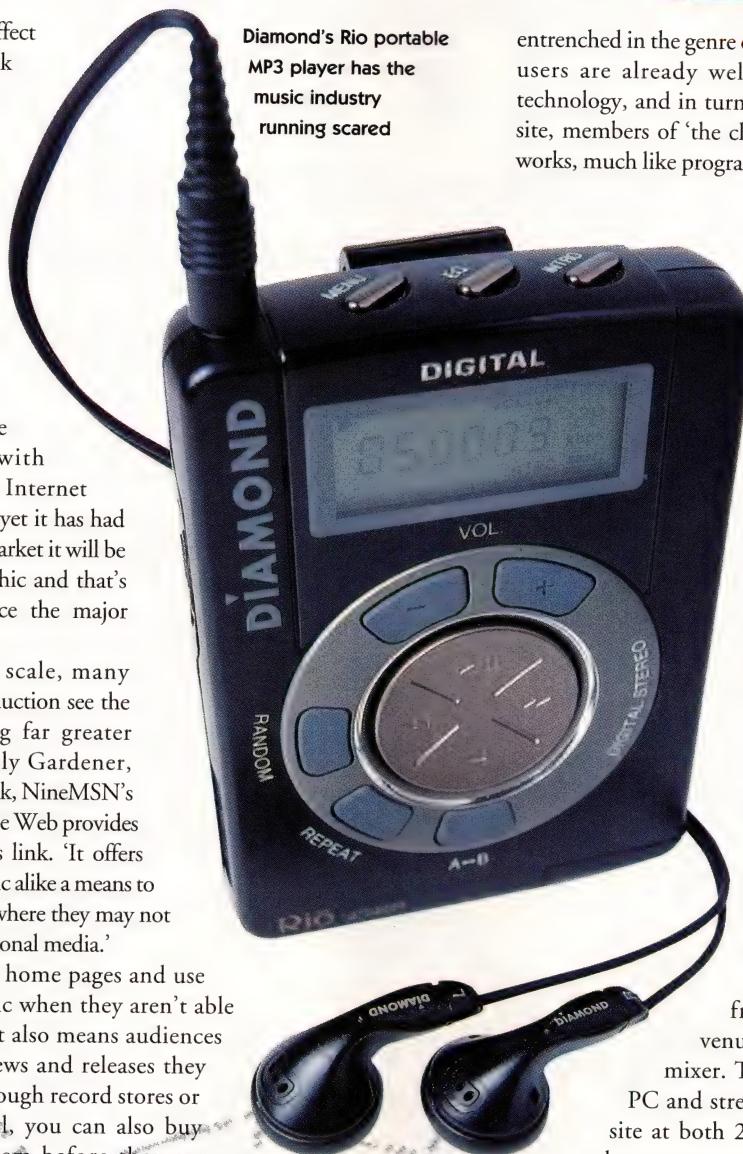
'Bands can have their own home pages and use them to distribute their music when they aren't able to get a recording contract. It also means audiences are able to get hold of previews and releases they couldn't otherwise obtain through record stores or the radio. In realms of retail, you can also buy CD's online and obtain them before they are actually released in Australia,' Gardener said.

Andy Grant, chief Web developer for Austereo, owners of syndicated radio stations 2MMM and 2DayFM, sees his predominant role to be melding the established radio dynamic with the 'newfound' medium of the Web. 'The Austereo Web sites aren't actually seen by the station as being a vehicle to generate income, they are seen more as media to bolster existing activity, promoting competitions and various events using soundgrabs and pictures. In many instances, audio grabs are gathered from various on air shows and placed online. We also feature live to air Webcasts using RealAudio and the Windows media player.'

For audio streaming Austereo uses the RealAudio encoder, though due to human resource constraints, downloadable plug ins aren't yet used. In terms of MP3, Grant believes that mainstream acceptance of the technology is quite a while off, though he acknowledges it still holds strong appeal. 'MP3 is a good way to go, and we're also keen to increase the amount of animation content through the use of tools such as Macromedia Flash.'

At the other end of the scale, left of field music 'collectives' such as Sydney based Clan Analogue ([www.clananalogue.com](http://www.clananalogue.com)) hope to challenge the ethic of major label domination, providing a site that offers independent and unsigned artists the chance to broadcast their wares online. Firmly

Diamond's Rio portable MP3 player has the music industry running scared



entrenched in the genre of electronica, Clan Analogue and its users are already well versed in the use of evolving technology, and in turn the Internet. By logging on to the site, members of 'the clan' can also collaborate on various works, much like programmers do with Linux.

Tackling the area of online broadcasting, Netcast specialists Auslife ([www.auslife.com](http://www.auslife.com)) have been producing, creating and coordinating online music broadcasts for a range of music industry clients, including record companies, radio stations and bands for the past three years.

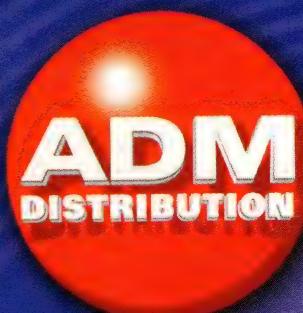
Specialists in live video streaming, Auslife provides live video on the net using tools such as Netshow from Microsoft and RealVideo. Additional tools include authoring software based on HTML and MPEG, and other archiving tools that enable the company to store video streams on their own site rather than on external sources.

A typical Webcast will see an online link established with a venue, using several top flight Pentium machines, each equipped with sound and video capture cards. Images captured from three cameras used at the venue are then edited using a video mixer. This video is then fed back to the

PC and streamed online via the Auslife Web site at both 28k and 56k settings to cater for home users and ISDN.

According to Nathan Oxley, technical director of Auslife, while video on the net is still retarded to five frames per second, technologies are evolving rapidly. 'Unlike three years ago, there is now the capability to allow users to automatically set themselves to a particular modem and connection speed. After offloading a live stream, the home user's configuration is automatically set to download a video stream at an effective rate. We also have the option of Quicktime or MPEG which caters for all levels of production complexity. Previously, if we wanted to cater for a home user and an ISDN user such as someone inside a company or in the US, we'd have to establish a separate video stream for both.'

In terms of technologies such as MP3, Oxley believes file size is a big limitation to their use via the Web. 'The bigger files don't travel as easily online and across modems, meaning that MP3 is far better suited to use on the individual desktop, with an MP3 player and CD than with the Net. From an industry perspective, Auslife MD Paul Aukette sees sluggish frame rates as the major impediment to netcasting gaining a wider reach. 'People in the music industry often think that TV is superior to Webcasting due to poor performance, but the reality is that the Web is an emerging technology and as such is destined to improve over the next few years, hence it is bound to gather wider acceptance.'



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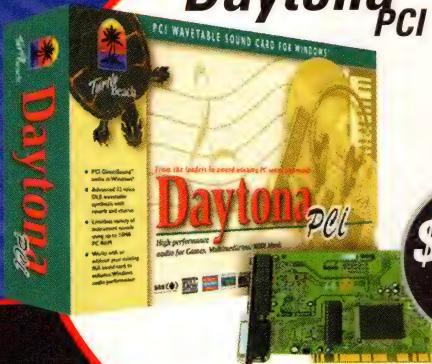


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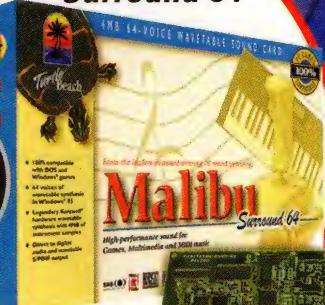
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## Copyright

All up, The Internet's increasing acceptance is widely perceived as a big threat to many music publishers, record labels and copyright owners who are obviously keen to track where their songs are being played and sold. There is also the question of Real Audio and new formats such as MP3 offering an alternative to conventional CD retail paths.

The issue of music used by ISPs is also the subject of much debate. On the local front, June 4, 1996 saw the Australian Performing Rights Association request a license fee from Australian ISPs. Their claim was based on the belief that since ISP users could access music performances, APRA's members were owed a royalty. Since ISPs were not forthcoming with payments, APRA took OzEmail to court in a test case to establish liability.

In summary, APRA went to court because OzEmail refused to pay a license fee to APRA, at the rate of \$1 per subscriber per annum, for allowing the downloading of music over the Internet. APRA represents the interest of artists and is responsible for the collection and distribution of royalties to them for 'performances' of their works. They hold that an ISP is allowing the transmission of a work and therefore should pay a license fee for such.

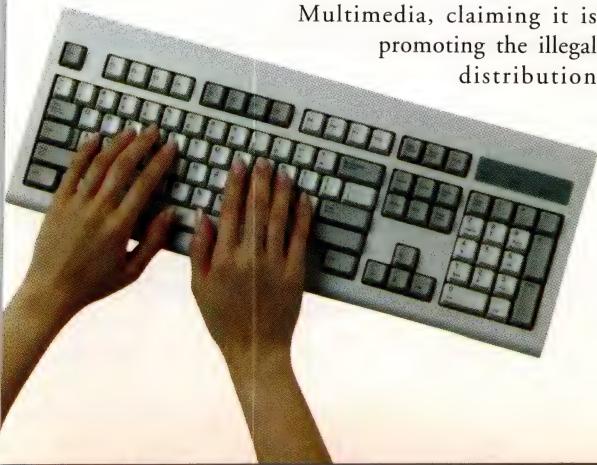
OzEmail and APRA have now agreed to settle the current action. The settlement was agreed in view of the potential expense of continuing on with the case, which would proceed on appeal through the Federal Court to the High Court. Given it would take another year or two to resolve the case, the commitment of time and people seemed futile for a legal decision based on what by then would be a superseded piece of legislation.

OzEmail took the view that it was more important to ensure that the government agreed to exempt ISPs from liability for all content, not just music, rather than fight for it in court. Under the terms of this settlement OzEmail agreed to make a payment to APRA and to co-operate with APRA to work towards a new Copyright Act which does not attribute responsibility to ISPs for material that is available on the Internet, except in the case where the ISP is the content provider.

Pending anticipated reforms to the Copyright Act next year, the agreement has been negotiated to allow more ISPs to join the settlement and therefore not be subject to legal action by APRA.

As discussed, MP3 shows much promise, particularly from a user perspective, though from the perspective of content owners, litigation alarm bells are ringing. Last year, the Recording Industry Association of America (RIAA) took several MP3 site Webmasters to court. Individual music corporations like Geffen Records are also taking an aggressive stance.

The RIAA turned up the heat in its fight against the MP3 format by suing Diamond Multimedia, claiming it is promoting the illegal distribution



## Music Web sites

GREAT SITES TO GET YOUR ONLINE MUSIC EXPERIENCE STARTED.

### General

- <http://www.cnotes.com> - Rock, Alternative Hip Hop, Metal, Jazz, Blues
- <http://www.80s.com> - Eighties server dukebox, range of samples
- <http://groovetech.com> - Dance music
- <http://www.clananalogue.org> Clan Analogue - dance music site; Flash, samples, info, links to other Clan Artists.
- <http://www.doctort.org/5000> Fingers of Dr T - Australian dance music performer
- <http://www.telemetryorchestra.com> - Electronica performers, The Telemetry Orchestra
- <http://systemx.autonomous.org/nerveagent/nerveagent.html> - Electronica performers Nerve Agent, MP3, RealAudio, MIDI, MP3
- <http://www.Mjuice.com> - Sells CD-quality MP3 music audio files over the Internet. Offerings include hard-to-find indie rock tunes and unreleased songs by popular artists.

### MP3

- <http://www.MP3 Place.com> - News, software and info.
- <http://www.mp3.box.sk.com> - Information resource for MP3 related software and links.
- <http://www.infomatch.com/mediabot/> - MP3Bot, MP3 search engine.
- <http://www.MP3now.com> - Links to the top 10 MP3 search engines, players, encoders, decoders, rippers for various platforms, and more.
- <http://www.mp3site.com/> - Chat, FAQ, skins, and more.
- <http://www.raum.com/mpeg/> - MPEG Audio Page; news, reviews and more.
- <http://www.eskimo.com/~miyaguchi/mp3.html> - Resource for MP3 information
- <http://www.geocities.com/Baja/7595/> - Mpeg3 Software and Utility Site; guide to MP3 recordings offers opinionated reviews of original MP3 music releases.
- <http://www.musicglobalnetwork.com/> - Music Global Network; Battle of the Web bands contest. Lots of MP3 songs. Good bands apply here for greater visibility. Learn how to make MP3s. MP3 players, rippers, and encoders.

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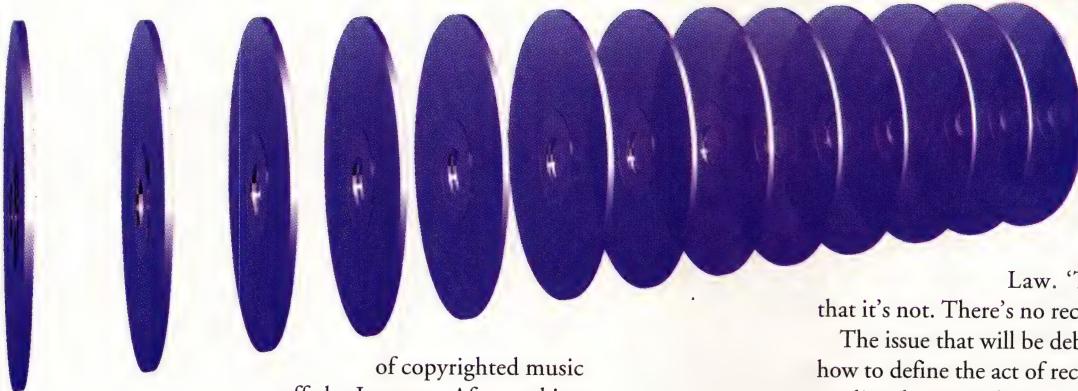


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## of copyrighted music

off the Internet. After seeking an injunction against San Jose-based Diamond Multimedia to halt the release of its Rio PMP300 player last year, the federal court in California granted RIAA a restraining order to halt its sale and distribution, marking the opening salvo in a war between the recording industry establishment and high-tech innovation.

Judge Audrey B. Collins of the United States District Court, Central District Court of California ordered a ten-day moratorium on sales of the Rio, but slapped the RIAA with a \$500,000 bond to cover potential damage incurred by the company during the ten-day period.

The RIAA cried foul play on the grounds that the Rio violated the American Home Recording Act, legislation that requires digital audio recording devices to implement code systems to curb serial recordings of copyrighted music. Diamond's legal team attributed the suit to the RIAA's fear that the device would threaten its control over music profits and distribution, and the defence argued that the Rio is a computer peripheral rather than a recording device.

In a further hearing, the judge concerned noted that the Rio cannot make serial copies of recordings. She said she was unsure, however, if the Audio Home Recording Act applies to the device, which downloads music from hard drives that already contain Internet audio files. US legislation exempts computer peripherals as well as other PC-related devices and programs.

The case underscores a number of issues regarding copyright and intellectual property law that have pitted record industry stalwarts against underground Internet music distributors. The suit came on the same day the US Senate passed a copyright bill that excluded a provision the RIAA helped author, which would require Webcasters to pay licensing fees to record companies.

In response to the claims made in the RIAA's suit, Diamond noted that the Rio is not a recording device to begin with, but a device that plays back files saved on a computer. The company also said that not allowing a playback device such as the Rio would be like 'newspapers outlawing ink-jet printers' to prevent users from reading articles while commuting to work.

'The biggest legal issue would be the question of whether the Rio is a digital audio recording device as

defined by the act,' said Brad Biddle an attorney specializing in Net and e-commerce issues with Cooley Godward and an adjunct professor of cyberspace law at the California Western School of Law. 'There's a plausible argument that it's not. There's no recording done on the Rio.'

The issue that will be debated most heavily in this case is how to define the act of recording when using a number of media: the Net, the PC, and the portable device. Even though computers essentially save downloaded files onto a hard drive, computers are not included in the Audio Home Recording Act because they serve additional functions beyond downloading. Ultimately, this fact will be Diamond's primary defense.

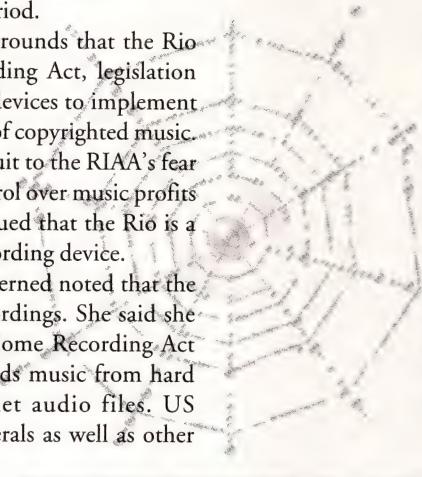
The central question here is does downloading constitute recording,' said Mark Mooradian, an analyst at Jupiter Communications. 'You can get a roomful of lawyers and argue about that into the millennium.'

The RIAA hopes other firms will join together in creating a standard where copyrights can be protected and everyone has equal opportunity in downloading files onto any device, said Sherman. The RIAA wants to play a significant role in establishing the standard.

However, should other firms decide to follow Diamond's example, the RIAA would not rule out pursuing legal action, unless the manufacturer ensured the industry that it would only play MP3 files that were previously approved by copyright holders, Sherman said.

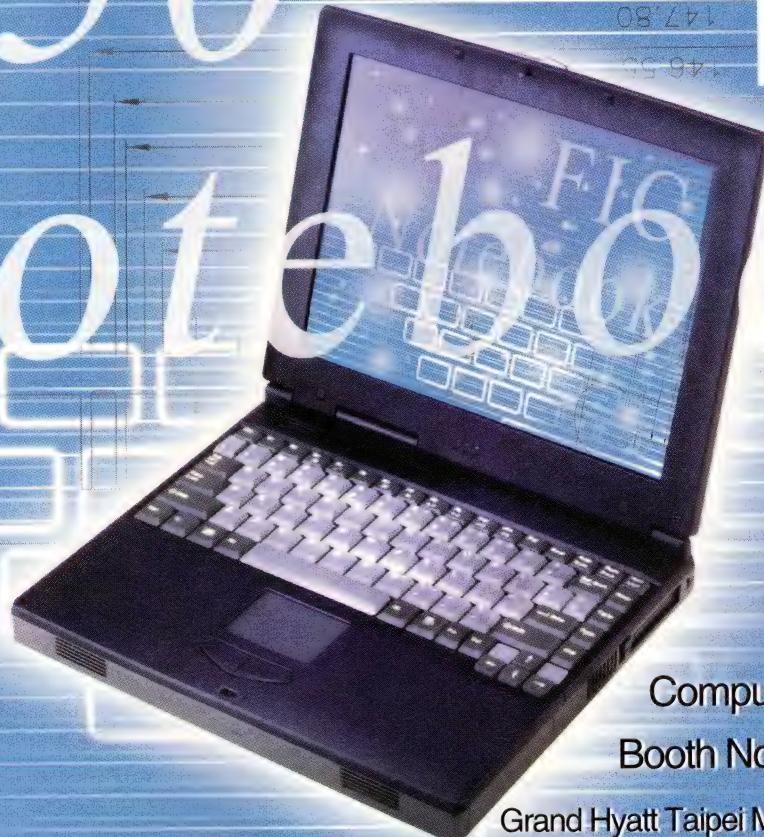
'The music industry is crashing into the Internet,' said Michael Robertson, who runs MP3.com, a site that has struck deals with recording artists and record labels to allow Netizens to download music files. 'They don't want to go into the Digital Age, and MP3 is dragging them there.'

Bolstering its cause, the RIAA has labeled MP3



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technology a threat to the recording industry, and has taken legal action against sites that use it to offer copyrighted music for download. 'We don't think that a legitimate commercial online market can occur if the market is first taken over by illegal copies,' said Cary Sherman, senior executive vice president and general counsel for the RIAA.

'If people can get music for free and take it away in the form of a Rio-type recorder, how can a legitimate commercial market emerge when it's in competition with a marketplace that's filled with illegal copies that are made for free?' he added.

The RIAA's action claimed Rio technology violated the 1992 Audio Home Recording Act, which requires digital recording devices, such as digital audio tapes (DAT), to encode a serial copy management system. Since DATs are able to record music from other DATs without degrading the music quality, the record industry perceived the technology as a threat. Thus, the legislation required DAT firms to incorporate a copy management system to prevent multiple generations of a given recording.

The RIAA has classified the Rio as a digital recording device, thus giving it reasons to seek the injunction. 'MP3 devices are covered by [the Audio Home Recording Act], and just as clearly they are in violation of it,' said Hillary Rosen, president and chief executive of the RIAA. 'Diamond Multimedia's product doesn't comply with the Act because it's not registered with the copyright office, it doesn't incorporate [a serial copy management system], and it doesn't pay royalties. Rio not only violates the law, it fails to respect the creativity of the artists.'

'There is no question about the Internet being a major challenge for us,' says Steven D'Onofrio, director of anti-piracy operations at the RIAA. 'Anyone that has a computer and modem can put up and take down recordings and distribute them at great speed to a vast audience.'

This doesn't mean that the industry plans to back down, however. As a spokesman for Geffen Records noted, 'We have sent cease and desist letters in the past and we will continue to do so. We are going to protect our rights and our artists' rights.'

It won't be easy. D'Onofrio says the RIAA has several full-time staff members who spend their days surfing the Net in search of copyright criminals. But these cops have an incredibly big beat to walk: there are at least three major sources of MP3 piracy.

The first, and easiest to quash, is the publicly accessible Web sites that allow direct downloading of MP3 singles. In the second half of 1997, the effrontery of such 'leech' sites had become increasingly brazen - and that, according to veterans of the MP3 scene, helped provoke the January crackdown by the RIAA and Geffen.

That campaign took out most of the biggest MP3 sites, say MP3 insiders - although they note that a horde of much smaller, less popular sites have sprung up to fill the vacuum. But there's a second, significantly more underground locus of activity - the world of MP3 'FTP' sites. FTP software (File Transfer Protocol, a technology that far predates the Web) allows anyone with a computer and a modem to

make files on their home computer accessible to the rest of the Net. Such sites may only be open to the public a few hours a day, or allow only a few simultaneous users, but there are thousands of them, with directories chock full of the latest MP3s. Shortly after the release of Madonna's first single from her latest album, one MP3 search engine returned a list of 63 different sites with the song.

D'Onofrio says the RIAA has had little trouble cracking down on students in the United States who use free college accounts to run their FTP servers, and that he's even had success getting foreign-based Internet providers to shut down sites. But some MP3 fans are skeptical.

'Right now many FTP sites that store thousands of songs for people to download at will are located outside of the US,' says Josh Malin, Webmaster of the MP3 information site The Ministry of Sound. 'The RIAA and individual bands are going to have a lot of trouble going after some guy running an FTP server in an Eastern European country that couldn't give a damn.'

'Future technology poses even more difficult problems for record companies,' says Malin. 'Right now the average home user has a 28.8/33.6 modem. When cable modems or ADSL are rolled out across the country, it will be easy for any regular home user to turn their own computer into an FTP server offering MP3 files at very fast speeds. Thousands of new servers could pop up daily, creating a nightmare for record companies.'

Even today, an FTP site can have its IP address reassigned and not be found again for weeks.'

Finally, there is the chat-room scene. MP3 trading in chat rooms may not approach the scale of FTP or Web site trading, but chat rooms are nonetheless remarkable for introducing cutting-edge delivery methods, and they're resilient in the face of punitive action. There are hundreds of different chat networks accessible from the Internet. Some of them, like the Internet Relay Chat network's 'EFNet' boast hundreds of chat channels in which MP3 trading activity occurs. The most popular are inhabited by user-friendly 'offerbots' - automated programs that deliver MP3 singles in response to specific text commands.

Offerbot-infested channels are operated by MP3 data-ripping gangs like the Calypso Production Society, a group of around 20 MP3 pirates who specialize in wholesale appropriation of popular compact discs into offerbot-accessible form. If reprisals are threatened, groups like the CPS can simply migrate to a new network or a new channel and continue their 'ripping'.

Through the torpor of copyright tensions, the Internet's immediacy, cost efficiency and ability to nurture new technologies place it in good stead to compete with existing media. The next step would seem to be the global realisation bandwidth necessary for emerging technologies to be fully realised. At this point, just how far off the creation of this level playing field remains anyone's guess. ☀





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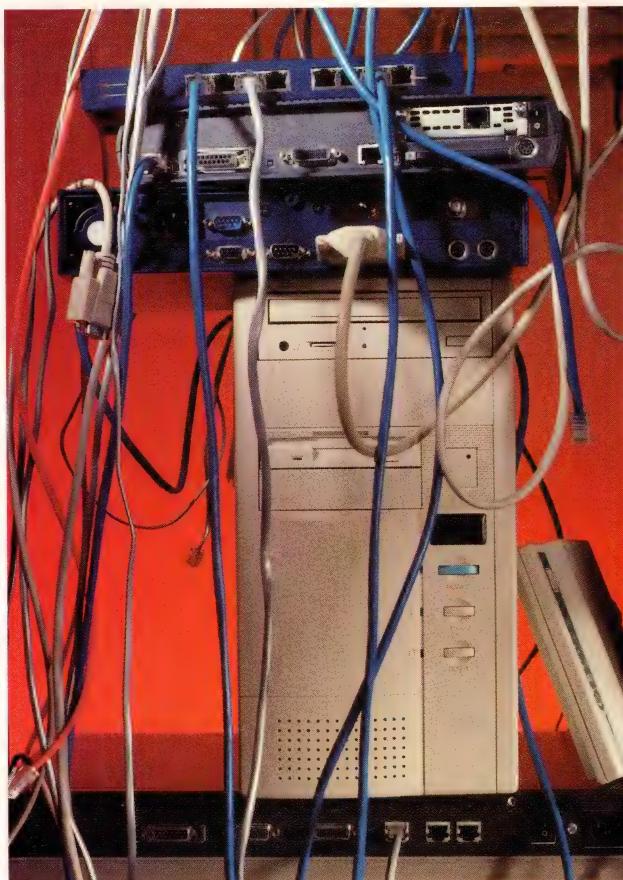
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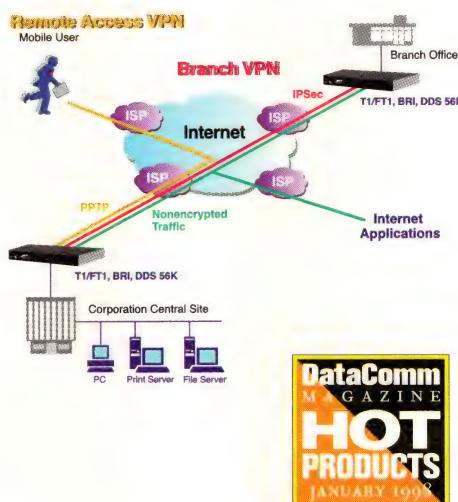
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# QUESTIONS & ANSWERS

DAVID MOSS TAMES A WAYWARD OUTLOOK 98, TRIPS THE LIGHT FANTASTIC WITH A MODEM, AND ENTICES INVISIBLE NETWARE SERVERS OUT OF HIDING.

## How long?

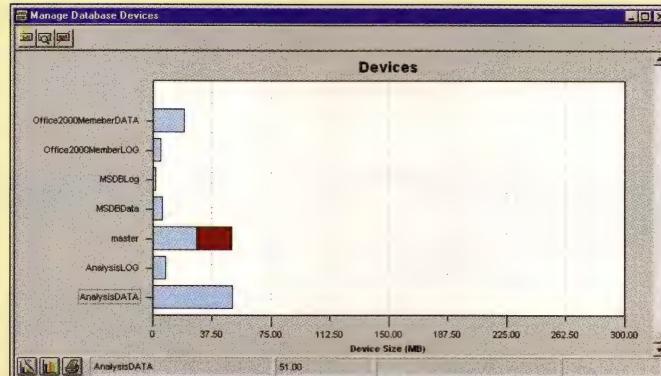
**Q** Can you please tell me how long it would take to convert databases to SQL Server 7 format from SQL Server 6.5 format? We have a number of very large databases that would need converting, and I've been asked to find out how long it would take.

*H Kaller*

**A** Actually, there are a number of factors that can affect the amount of time needed to convert SQL Server 6.x databases to SQL Server 7. For example, each object in the SQL Server 6.x database must be rebuilt in the SQL Server 7 database, and every row must be transferred. You can easily end up with the situation where the length of time required to convert two databases of equal size may vary widely, depending on the complexity of each database and whether they hold different numbers of rows and/or objects.

There are other significant factors at play here too, like the hardware platform, the number of processors, the disk subsystem and obviously the amount of RAM. Selecting the Data Validation option during setup will increase the amount of time needed to perform the upgrade by a factor of two. All this being said, Microsoft has produced some guideline figures which might help you in your analysis. Some typical times for the upgrade process are:

400Mb	Less than 20 minutes
1Gb	Less than one hour
10Gb	Less than four hours
50Gb	Less than 12 hours
100Gb	Less than 24 hours



The length of time it takes to convert SQL Server 6.5 databases to SQL Server 7 databases will depend on a number of factors.

## Gloomy Outlook

**Q** I can't send or receive email with Outlook 98, but instead get the following error message: 'Internet Mail is not registered properly. Please reinstall and try again. {Account: "Free Serve Account", SMTP Server: "smtp.freereserve.net", Error Number: 0x80040 154}' A similar message comes up with POP3 mail, although it works perfectly with Outlook Express, Pegasus Mail and even Hotmail.

At first I thought the problem was my mail settings, so I re-imported them from Outlook Express but this didn't help. I then changed all the server time-outs; this didn't help either. I've reinstalled Outlook 98 to no avail. I phoned my ISP and asked it to reinstall my account. I've even tried my university account, but that refuses to work too. I've signed up with other ISPs as well and none of their accounts work either. I know I can use other programs to email, but I find Outlook 98 a lot

easier; it also has more functionality.

Lastly, if I ever get Outlook to work, is there any way of receiving confirmation that the recipient has read my mail? I know this is possible in Pegasus, but I really don't like the user interface.

*P Massey*

**A** Starting with the first problem, this is an error message that appears when OUTLMIME.DLL, a rather important file that is employed at some point in the mail transfer process, hasn't been properly registered. There are a number of solutions, depending on the operating system

you're using, and they are as follows:

### Windows 98

- 1 Click on the Start button, select the Settings menu item, then the Control Panel menu item.
- 2 Double-click Add/Remove Programs.
- 3 On the Windows Setup tab, click to uncheck Outlook Express and click OK to uninstall it.
- 4 After Outlook Express is uninstalled, repeat steps 1 through 3 to reinstall it.

### Windows 95/98

These steps assume that you installed Outlook in the Microsoft Office 97 default installation path, so you'll have to modify some of the paths if you installed it elsewhere.

- 1 Close down Outlook and any other programs that are currently running. Click the Start button, select the Programs menu item and click MS-DOS Prompt.
- 2 In the MS-DOS Prompt window, type (include quotation marks):  
cd "\program files\microsoft office\office"

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# David's tip 1

## Troubleshooting SPOOL32 errors

- SPOOL32 caused a General Protection Fault in module KERNEL32.DLL at <address>.
- SPOOL32 caused an Invalid Page Fault in module KERNEL32.DLL at <address>.
- SPOOL32 caused a Stack Fault in module KERNEL32.DLL at <address>.
- SPOOL32 caused a General Protection Fault in module <unknown> at <address>.
- SPOOL32 caused an Invalid Page Fault in module <unknown> at <address>.
- SPOOL32 caused a Stack Fault in module <unknown> at <address>.

If any of the above messages seem familiar, you may be reassured to know that you're not alone. I've had quite a few SPOOL32 problems sent in, so I'm going to address them all in one go. I'd like to thank my friends at Microsoft PSS for their help in assembling this data.

Start off by disabling all non-essential drivers and programs – by clean booting, in fact. To do this, follow the steps in the appropriate section:

### Windows 95

- 1 Click on the Start button, select the Find menu option and then click on the Files Or Folders menu option.
- 2 Click the Include Subfolders checkbox to clear it.
- 3 In the Named box, type 'CONFIG.SYS AUTOEXEC.BAT' (without the quotation marks) and then click Find Now.
- 4 In the list of found files, right-click the AUTOEXEC.BAT file, click Rename and then type a new name for the AUTOEXEC.BAT file (such as AUTOEXEC.XXX).
- 5 Repeat step 4 with the CONFIG.SYS file.
- 6 Quit the Find tool and restart your computer.

### Windows 98

- 1 Click on the Start button, select the Programs menu item, followed by the Accessories menu item, the System Tools menu item and finally

and press the Enter key.

- 2 In the MS-DOS Prompt window, type:

c:\windows\system\regsvr32

outlmmime.dll

and press the Enter key. You'll receive the following message:

DllRegisterServer in  
outlmmime.dll succeeded.

Click OK and click the Close button to close the MS-DOS prompt window. (See the Further Info section if you have problems with this step.)

- 4 Start Outlook and send a mail message to test

click on the System Information menu item.

- 2 On the Tools menu, now click System Configuration Utility.
- 3 On the General tab, click the following checkboxes to clear them:  
process CONFIG.SYS file, process AUTOEXEC.BAT file, process WINSTART.BAT file, process SYSTEM.INI file, process WIN.INI file.
- 4 Load Startup Group Items, Click OK and then quit the System Information tool.
- 5 Restart your computer.

The clean-boot process eliminates the possibility that an anti-virus program or other utility is causing the SPOOL32 error message, and it should also disable any third-party printing software such as Hewlett-Packard Port Monitor or Epson Spooler. Now change the spooling format from Enhanced Metafile (EMF) to RAW, and attempt to print directly to the printer instead of spooling the print job. To do that, follow these steps:

- 1 Click on the Start button, select the Programs menu item and click on the Printers menu item.
- 2 Right-click the printer you're using and then click Properties.
- 3 On the Details tab, click Spool Settings.
- 4 Click Print Directly To The Printer.
- 5 In the Spool Data Format box, click RAW.
- 6 Click OK, click OK again, and then close the Printers window.

That last method should also solve problems if the Exclusive Port Control checkbox is selected in Canon's MultiPASS Desktop Manager Tool. You can use either the method above or this next one, which clears the Exclusive Port Control checkbox, to fix that:

- 1 Click on the Start button, select the Programs menu item, and then click on the MultiPASS Desktop Manager.
- 2 Go to the File menu and select the Preferences menu option.
- 3 Click the Exclusive Port Control checkbox to

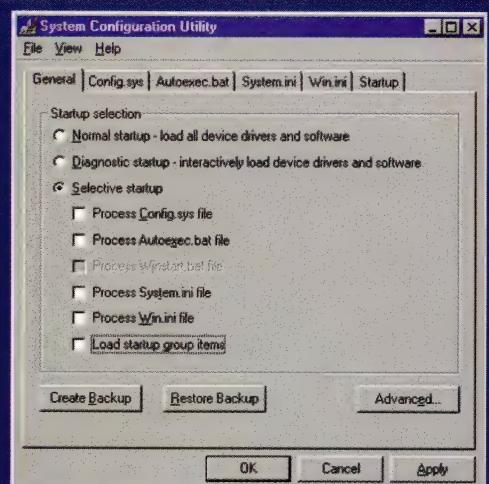
your mail functionality.

### Windows NT 4

- 1 Close down Outlook and any other programs that are running. Click the Start button, point to Programs and click Command Prompt.
- 2 In the Command Prompt window, type:  
cd\program files\microsoft office\office
- 3 In the Command Prompt window, type:  
c:\winnt\system32\regsvr32  
outlmmime.dll

You'll receive the following message:

DllRegisterServer in



Do your selective startups under Windows 98 here.

clear it and then click on the OK button.

- 4 Restart your system.

Another cause for the SPOOL32 error messages above is that there may be a terminate-and-stay-resident (TSR) or other program that prevents SPOOL32.EXE from being run when Windows 95/98 starts. To work around this issue, use one of the following methods:

Create a shortcut to the <windows>\system\spool32.exe file in the StartUp folder, where <windows> is the folder in which Windows 95/98 is installed. For information about how to do so, click Start, click Help, click the Index tab, type 'shortcuts' (without quotation marks), and then double-click the 'Creating' topic. Using a text editor (such as Notepad), add the following line to the Load= or Run= line in the [Windows] section of the WIN.INI file:

<drive>:\<windows>\system\spool32.exe

where <drive> is the drive on which Windows 95/98 is installed, and <windows> is the folder in which Windows 95/98 is installed.

At the end of the day, of course, there may be a genuine problem with the printer driver itself. The only way to confirm this is to check with the printer manufacturer – via its Web site is usually a good idea – to determine whether an updated printer driver might be available.

outlmmime.dll succeeded.

Click OK and click the Close button to close the Command Prompt window. (Again, see the Further Info section if you experience problems.)

- 4 Start Outlook and send a mail message to test your mail functionality.

Note that in step 3 of methods 2 and 3 you may need to enter the full path to the System folder in Windows 95/98 or the System32 folder in Windows NT. For Windows 95 or 98, the typical command line is:

c:\windows\system\regsvr32  
outlmmime.dll

## David's tip 2

### MTS files not updated by Windows NT 4 SP4

I've just discovered that if you don't install Microsoft Transaction Server (MTS) into the default folder (<systemroot>\Program Files\MTS), the Windows NT 4 SP4 installation process will not detect the MTS files or update them. Microsoft does have a fix for this, although I don't believe it's been fully regression tested yet. I'd suggest you contact Microsoft PSS directly if this is the case with your MTS installation. Note: this only applies if you didn't install MTS into the default folder.

For Windows NT, the typical command line is:

```
c:\winnt\system32\regsvr32
outlmime.dll
```

If you're not sure, to discover the full system path, follow these steps:

On the Start menu, point to Programs and click MS-DOS Prompt in Windows 95/98 or Command Prompt in Windows NT. In the MS-DOS Prompt or Command Prompt window, type 'Set' (without the quotation marks) and press Enter. The line that begins with PATH defines the full system path.

#### Troubled install #1

Q Every time I try and install a program, I get this error message: 'Cannot run the 16-bit Windows program. The application is not supported by Windows NT.' These programs run perfectly well on other systems here, so why should this one be any different?

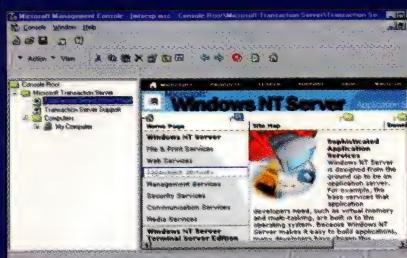
A Gudge

Sometimes when you try and install or run a program, any one of the following error messages may appear:

- Cannot run 16-bit Windows program. This program requires a newer version of Windows.
- Cannot run the 16-bit program. The application is not supported by Windows NT.
- Cannot run 16-bit Windows program. One of the library files needed to run <path>\<program> is damaged. Please reinstall this application.

This problem may occur when a program attempts to access a missing, damaged, outdated or incorrect version of a DLL file. The solution is to expand all the following DLL files from the original Windows NT CD to the <Systemroot>\System32 directory: COMOBJ.DLL, DDEML.DLL, OLE2.DLL, OLE2DISP.DLL, STORAGE.DLL, CTL3DV2.DLL, OLE2NLS.DLL, STDOLE.TLB, TYPELIB.DLL, VER.DLL.

The VER.DLL file is located in the %SystemRoot%\System folder and the %SystemRoot%\System32 folder; both versions have the same file size and date.



Microsoft Transaction Server is running, but has it been updated?

#### Troubled install #2

Q I installed two programs the other day. Both are running fine, but Outlook 98 has really slowed down, especially if I try to get it to run or to shut down. I tried uninstalling and reinstalling the new programs, but it hasn't made any difference.

G Taylor

A This problem can occur if the incorrect versions of the files MSVCRT40.DLL and MSVCRT.DLL are installed on your system. It can also happen if they're the wrong size: their correct sizes are as follows: MSVCRT40.DLL, 319Kb; MSVCRT.DLL, 421Kb.

Both files should be in the <windows>\system folder, where <windows> represents the location of your Windows folder; for example, c:\windows. To update these files, you should first rename the current files on your computer, and then replace them by running Outlook 98 Active Setup. To rename the current files, do the following:

- 1 Close all open programs.
- 2 Click Start, point to Programs and click Windows Explorer.
- 3 In the folder list, click the plus (+) sign next to the Windows folder to open it.
- 4 Click the System folder to open it.
- 5 In the right pane, locate the file MSVCRT40.DLL. Right-click on it, and then click Rename.
- 6 Type Msvcrt40.old and then press Enter.
- 7 Repeat steps 5 and 6 and rename MSVCRT.DLL to MSVCRT.OLD.

If the files are not visible, on the View menu, click Folder Options. On the View tab, click to select Show All Files. Click to clear 'Hide file extensions of known file types.' Click OK.

Having done that, you should now reinstall Outlook, thus

replacing the files you just renamed.

- 1 Click Start, point to Settings and click Add/Remove Programs.
- 2 On the file list, click Microsoft Outlook 98 and then click Add/Remove.
- 3 Depending on the method you originally used to run Setup, you may be prompted to insert an Outlook CD or to connect to the Internet to complete the installation.
- 4 In the Maintenance Wizard, click Rerun Outlook Setup. This will refresh the Setup based on the last installation and replace the renamed files with the new updated versions.
- 5 Restart the computer and start Outlook.

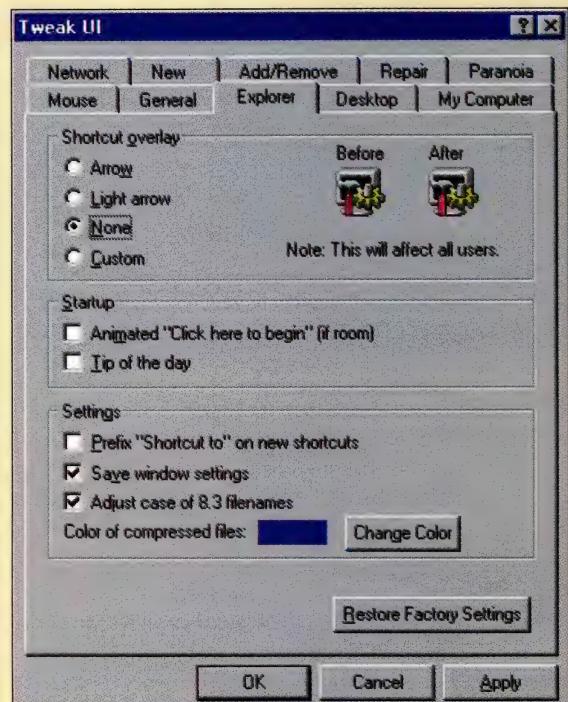
#### Tweak it!

Q Some while ago I believe you demonstrated a way in which the Shortcut arrow on Windows Desktop icons could be removed. I seem to have mislaid this article. Could you please tell me again how this can be done?

M Tawfik

A Certainly, this is a fairly common question, so here's a reminder for all who have forgotten, and an introduction for all those who never knew. There are in fact two ways of dealing with this: one involves hacking the Registry, while the other involves downloading an unsupported utility from Microsoft called TweakUI (one of a series of utilities called PowerToys, provided on an As-Is basis by Microsoft).

For those happy with the thought of hacking the Registry, the way to do it is to fire up Regedit (REGEDIT.EXE) and to search the Registry for the following keys. Once you've found



Get rid of those shortcut arrows by using TweakUI.

## Reader's tip 1

### Folder names you don't want to use

I'd like to thank Dave Garret for taking the time to send in this entertaining (for those of us reading it now, anyway) and cautionary tale on how not to name folders under Windows.

'This one is a real nasty bug in Windows 95 and may exist in Windows 98. I only found it by accident but you'll like it I'm sure. I have, since initially installing Windows 95 on my PC, created a directory called C:\PROGRAM on my hard disk where I install DOS/16-bit Windows apps that don't support long filenames. No special reason for this, I just like to keep them separate and don't like the system-generated abbreviated filenames with the ~1 appended.'

I had just installed IE 4 Active Desktop on my PC (more fool me) and was trying to fix all the problems it had created. Apart from all the Access Violations and disappearing Tray icons, the system started to open up my folder C:\PROGRAM on the desktop each time Windows started. Renaming this folder cured the problem, but it would have taken a lot of

work to reinstall all the programs now with duff INI file settings. This was in fact the least of my worries, and I eventually had to resort to restoring my system from a very recent Drive Image (PowerQuest is fantastic).

I was pondering over all the problems I had encountered and decided that, although I can live without Active Desktop, I should still attempt to discover/resolve as many of these problems as possible. I suspected I'd get the same results as and when I ever upgraded to Windows 98.

The first course of action was to rename the C:\PROGRAM directory. I did this from Windows Explorer, which immediately warned me that it would impact on some registered programs. Being a nervous kind of chap I examined each subdirectory of C:\PROGRAM in turn, finding each reference in the Registry and reinstalling the affected application in a new directory called D:\UTILITY.

At last, all my applications were moved over and all I was left with was C:\PROGRAM.

However, each time I tried to rename or delete it I was given the warning 'This may impact on registered programs'. I decided to go for a less drastic approach as I know that Windows 95 tries to be clever and will update the Registry based on directory changes made with Explorer.

I renamed C:\PROGRAM to \PROGRAM.X. I then went into REGEDIT and searched for \PROGRAM.X. Imagine my surprise when I found that Windows 95 had updated all occurrences of 'C:\Program Files' to 'C:\PROGRAM.X Files'. To correct this potentially killer problem, I simply renamed C:\PROGRAM.X to C:\PROGRAM, rebooted my PC into DOS mode and renamed/deleted the directory from DOS. This ensured that Windows wouldn't know about the change and wouldn't attempt to update the Registry as a result. The moral of the story is that you should never create a directory called C:\PROGRAM or any substring of C:\Program Files (or even C:\Windows, I suspect). I hope Microsoft reads this and takes note.'

Thank you for that, Dave. I'm sure it will.

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them, remove the *IsShortcut* value from: `HKEY_CLASSES_ROOT\lnkfile`  
`HKEY_CLASSES_ROOT\piffile`

Don't forget to back up the *SYSTEM.DAT* and *USER.DAT* files before you do this.

For those who prefer not to meddle with the Registry directly, the utility *TweakUI* will do the job for you. To get it and the other *PowerToys*, go to [www.microsoft.com/windows/downloads/default.asp](http://www.microsoft.com/windows/downloads/default.asp)

You can now download the tools you want. The tools are OS-sensitive, so if you have Windows 98, make sure you download the tools for 98 only. I believe the Windows 95 and NT 4 tools are interchangeable, but to be on the safe side, select your OS from the list provided and download the tools from the correct section.

To install the tools, simply create a new folder called *PowerToys*, and then (if you wish) subfolders for each tool you download – I do this because they are updated every so often and I find it handy to keep them separate. All you have to do then is double-click on the self-extracting executable of each tool you downloaded, and then you can right-click on its *INF* file. Choose the *Install* menu option from the pop-up menu that appears, and that's all there is to it.

*TweakUI* installs itself as an icon in Control Panel, so double-click on the *TweakUI* icon and wander through its many tabs to see just what it allows you to do to your Windows environment. I should point out that *TweakUI* can cause minor problems for some people; when I use it, I get warning messages about my Matrox MGA Control Panel CPL file being upset, although it doesn't seem to do any harm. Make sure you read the *readme* file that accompanies each new control.

### Rewriting history

**Q** I've been trying to find a way of cutting down the amount of history data stored by our Systems Management Server. I don't want to delete the entire history, but I'd like to get rid of history data from before specific dates. The main operator recently left the company and I've been handed the task of managing the system.

*L Williams*

**A** You'll be relieved to know it's quite easy to delete history records created before a date specified by yourself. Simply follow these steps:

- 1 Open the Systems Management Server Administrator program and then open the Sites window.

2 On the Edit menu, click *Delete Special*.

3 Select *Machine History Records*, and specify your date criteria (for example, dated before `<date>` or older than `<xxx>` days). This way you can either use a specific cut-off date to determine those records to be deleted, or specify that records older than a certain number of days are to be deleted.

**④ Run the Systems Management Server Database Manager (DBCLEAN.EXE).** To start Database Manager, on the Tools menu click *Delete Unused Common/Specific Records*.

### Flickermouse

**Q** Every time I move my mouse, my modem lights flicker on and off. It doesn't appear to be doing any harm, but I'd like to stop it if I can. I can only imagine it must be an interrupt problem, but nothing I've tried has helped.

*I Mason*

**A** Actually, you're not alone here. Several people have contacted me over the years regarding this phenomenon, and I'm glad to tell you that I now have a solution. In fact, I got the solution from Microsoft's tech support, and it offers a number of rather amusing suggestions as to what you can do to clear this matter up. The problem is in fact an address clash rather than an interrupt problem, and it happens when you use COM4 as your modem port.

Apparently, some of the older S3 video chipsets decode the x2E8 address range incorrectly when compared with the I/O address mapping carried out by Windows 95 or 98. The affected chipsets include the 801, 805 and 928 versions, and so can effect the Diamond Stealth 32 and Stealth 64, the Orchid Technology Fahrenheit 1280, and most models of S3 video cards. You won't get this problem with the 964/984, trio.64/32 or 866/868/968 chipsets, nor does it happen with the newer S3 chipsets.

The solutions Microsoft offered are as follows:

1 Contact S3 and ask for an address change.

Sounds fair enough. I rather fancy a six-bedroom Georgian manor set in six acres of old England.

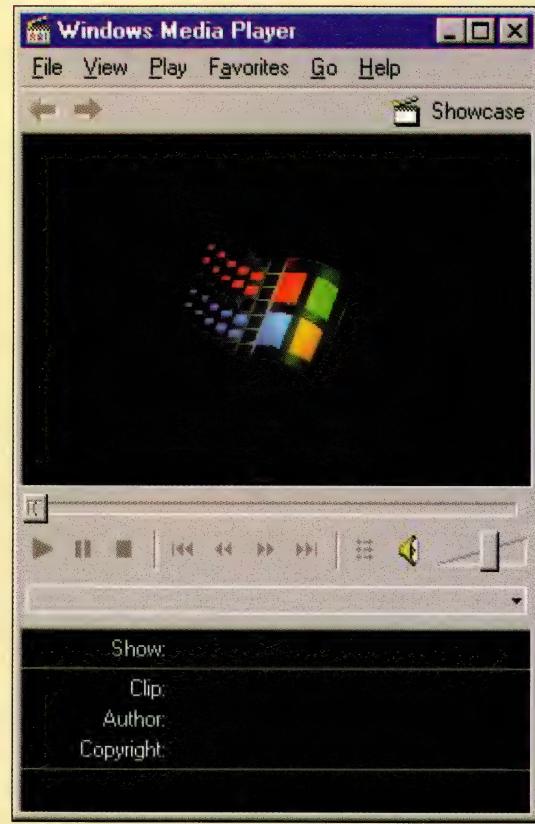
2 Use a Windows 3.1x S3 video driver.

Absolutely. To be fair, Microsoft does point out that this may incur some interesting side-effects such as loss of some Windows 95/98 video functionality. So trust me, you really don't want to do this.

3 Reduce your video colour depth to 256 colours or less, and set the hardware acceleration slider to None.

Why not, I've never liked the way modern computers are so fast, and this will certainly solve that problem. Who needs all those colours anyway? It's not as if we're all graphics designers, is it?

By now, my laughter was almost uncontrollable. I apologise unreservedly to the earnest souls behind the last two solutions, but in the words of John McEnroe: 'You cannot



Make sure you have the latest Microsoft Media Player if you want to hear those MP3 files.

be serious?'

**④ Move the modem off COM4 to another available COM Port.**

My wife came up with two other excellent suggestions: one was to slap a Post-It note over the front of your modem, the other was to substitute the Post-It with a vase of flowers. Personally, I'd go for options 1 or 4, but then I'm the serious one here. And to the ever-helpful team at Microsoft PSS, just a joke guys, honest!

### Media muddle

**Q** I can't get MP3 files to play under Windows 98 with the Media Player. Does Microsoft not support this file format?

*A Dean*

**A** Microsoft does support the MP3 format, but you'll need to download the latest version of the Microsoft Media Player to play the files. You can find it at [www.microsoft.com/windows/mediaplayer/default.asp](http://www.microsoft.com/windows/mediaplayer/default.asp)

### Invisible servers

**Q** We can't all see our Novell NetWare servers in Network Neighbourhood when we try and access them from our NT 4 systems, and it doesn't seem to matter if they're workstations or servers. Can you help?

*F Hartschon*

**A** I don't know if this will be of any benefit, but it's all I've been able to come up with. Basically, this can occur if you have Microsoft

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# REAL WORLD COMPUTING

## TECHNICAL SUPPORT



This is the site to visit if you want to find out Microsoft's position for the year 2000.

Gateway (and Client) Services for NetWare (GSNW) installed, and your computer is configured for automatic frame detection. NetWare servers are explicitly configured to use either Ethernet 802.2 or 802.3 frames, and reception of multiple-frame types is disabled in NT when you choose automatic frame detection.

The solution, therefore, is to configure your computer to use multiple-frame types. To configure NWLink for multiple-frame types, edit

the Registry in the following location, not forgetting to take backup copies of SYSTEM.DAT and USER.DAT before you start:

① Start off as usual by firing up the Registry Editor, then under the subtree HKEY\_LOCAL\_MACHINE, find the PKType parameter for the following subkey:

SYSTEM\CurrentControlSet\Services\NWLink\lp\NetConfig\<network\_card> where <network\_card> is the name of the driver for your network card.

② If the value is set to <ff>, remove this entry. You may set the PKType parameter to two or more values. When you edit the PKType value, each of the entries for a frame type should be on its own line in the Multistring Editor dialog box. See below to work out what values to use.

Value	Frame type
0	Ethernet II
1	Ethernet 802.3
2	Ethernet 802.2
3	Ethernet SNAP
4	Arcnet
FF	Auto Detect

③ Quit Registry Editor and restart your computer.

Alternatively, if you want to connect to two NetWare servers, make sure you have multiple

frames bound to the network card on one of your NetWare servers. This NetWare server becomes a router for your Windows NT Workstations and as a result the browse list displays all NetWare servers, whether they use 802.3 or 802.2 frames.

### Windows Y2K

Q Do you know where I can find out about Windows 95 and the Y2K issues related to it?

I Wardleworth

A The URL you want is: [www.microsoft.com/technet/topics/year2k/default.htm](http://www.microsoft.com/technet/topics/year2k/default.htm) You'll find coverage of Y2K issues for all Microsoft products there. ☺

### David Moss



Software developer, consultant, Web designer and freelance computer journalist specialising in Visual Basic and Windows.

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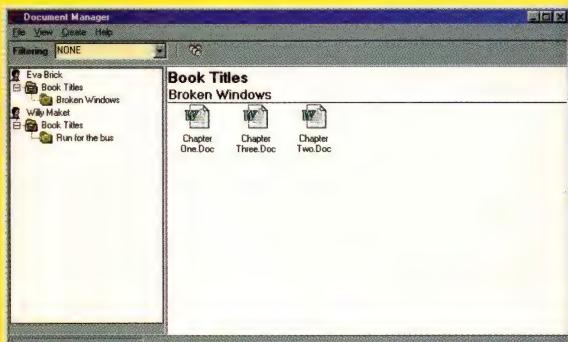
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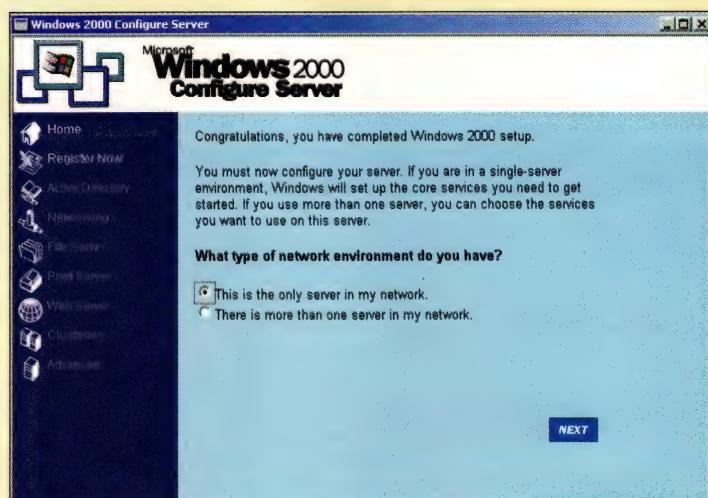
# 2000: AN OS ODYSSEY

JON HONEYBALL LOOKS AT AN INTERIM BUILD OF WINDOWS 2000, IS DISAPPOINTED BY LINUX BUT THEN ENRAPTURED BY THE QUBE.

**A**llow me a wry smile: the splash screen for the pre-betas of Windows 2000 beta 3 has the words 'Built with NT technology' proudly emblazoned across it. Those blessed with good memories will recall that NT originally stood for 'New Technology', so now we have Windows 2000 built with New Technology technology – is this an example of reliability through redundancy? The code itself is a machine-full too. I'll confess to being somewhat surprised to see the light on my hard disk almost permanently illuminated on my 64Mb 'sacrificial lamb' Pentium II/266, until I remembered that I'd turned on disk indexing which meant it was chewing through the disk looking for useful information.

I could rant and rave about how the driver support is horribly broken, but in fairness to Microsoft this is an interim build, not the full beta 3 code. And I have to admit that the private beta newsgroups for the beta testers are fully staffed by knowledgeable Microsofties, who are working right there on the product in Redmond. It is odd to report a problem and receive a response within hours – if only such a service could be made available for day-to-day users of the shrinkwrapped products.

One set of major improvements to Windows 2000 concerns the area of configuration. We've



Configuring a Windows 2000 server now has a Wizard. It almost works too.

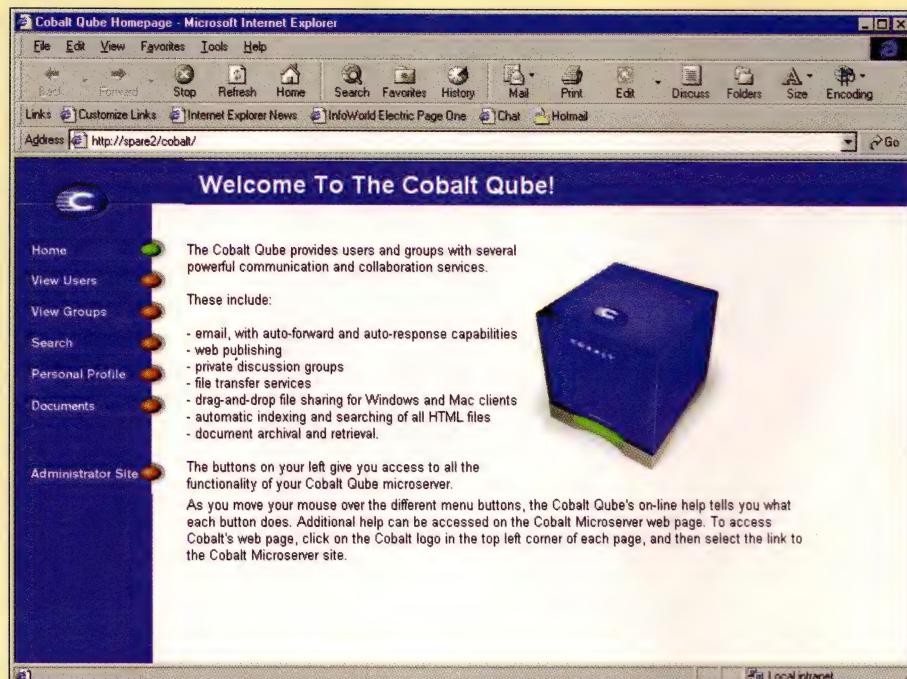
all seen standard URLs that specify protocols like http: and ftp: – well, now there's a new one called res: and you'll start to see URLs like 'res://srrwiz.cpl/default.htm' which point you to a machine configuration Wizard. And a very good Wizard it is too: it's small, but vital details like this will make the difference between a painful upgrade and an easy one. However, I'm still not entirely convinced that Joe Public will be able to wrap his head around the Windows 2000 product, simply because it's crammed with such a mind-boggling amount of stuff. Just one dialog box in Windows 2000 may expose what a few years ago would have been a whole OS worth of functionality, and this is deeply scary. At times, I feel a sense of *déjà vu* from my old adventure gaming days. 'You are in a maze of twisting passages, all of which look the same.' But – and this is a very big 'but' – when you do

get it installed and configured, it works. I will confess that about six months ago I had serious doubts regarding Microsoft's ability to pull this off, but I am now prepared to accept that it will come together eventually.

I managed to sort out the power management problem on my Toshiba Libretto. It seems there's a TXTSETUP.SIF text file which holds a lot of setup information, and if you scan this file for [ACPIOptions] you'll find a setting called ACPIEnable. In this build it was set to a value of two, which meant that ACPI support would be enabled if an ACPI BIOS was found. A

value of zero means that no ACPI support will be installed, while the value of two means that ACPI will only be enabled if the machine is explicitly listed in both the [GoodACPIBios] listing and in the [ACPIBiosDate] listing too. Setting the value to one and reinstalling the OS re-enabled my ACPI support.

It's because of new details such as these that Windows 2000 gives me the heebies. In the past, we all built up a good working knowledge of what switches were provided on winnt32 to make installations easy, like the old /B to do a floppy disk-less install, or /OX to recreate the floppy images. However, it is now clear that a completely new set of tweaks and adjustments will need to be learned in order to make Windows 2000 work in a way appropriate to our needs.



The Cobalt Qube – simplicity itself, a true computing appliance for the new millennium.

### Cube The Qube

Sometimes you come across a device which is so right, so carefully and cleverly considered, that you just have to shout about it from the rooftops. However, before I start the shouting, a brief digression... I have recently been trying out Linux in various incarnations, and have found the experience to be sorely disappointing.

This is not due to any fundamental problem with the operating system itself – it's a very powerful, mature platform and you can achieve excellent work with it. However, its installation routines are horrible, just horrible. I tried to install RedHat 5.1 onto a spare machine, whereby the setup program lulled me into a delightful sense of security, with lots of handholding screens and sensible default choices. Then, bang, I was dumped straight into the Linux equivalent of FDISK where I had to set up volumes.

Even the easy version of this tool would be completely opaque to someone with no knowledge of Linux and Unix, and my attempts at installation ground to a halt right there and then. I checked out the on-line documentation on another machine, but that didn't prove very helpful either. A few weeks later I tried RedHat 5.2 which has a much more successful installation procedure – it actually took the sensible route, taking the available spare disk space and assigning it for its own purposes as appropriate. Just one small tweak to that setup program had transformed its usability. Having got Linux up and running, I now had an excellent Internet server platform – Apache, plus a fully-featured email server, DNS facilities and so forth. But it

still wasn't quite 'right'. It still required a great deal of 'inner knowledge' to make it a workable solution, when what I actually wanted was a 'computing appliance'.

Then, having vaped the hard disk, I tried installing BeOS version 4 onto the same machine – a new, modern operating system written from the ground up. Since big claims had been lavished upon it by various friends and acquaintances, I was anticipating a certain degree of fun, and I wasn't disappointed. It didn't recognise the bog-standard network or graphics card in my machine, which meant I was left with a  $640 \times 480$  greyscale display and no Internet connectivity. A perusal of the supported hardware list threw up only about half a dozen supported cards, which wasn't going to get me very far. The supplied CD had a few basic demo applications but nothing else of immediate play value. I suppose I could have used the supplied SDK to start programming the box, but my desire to have a life got in the way.

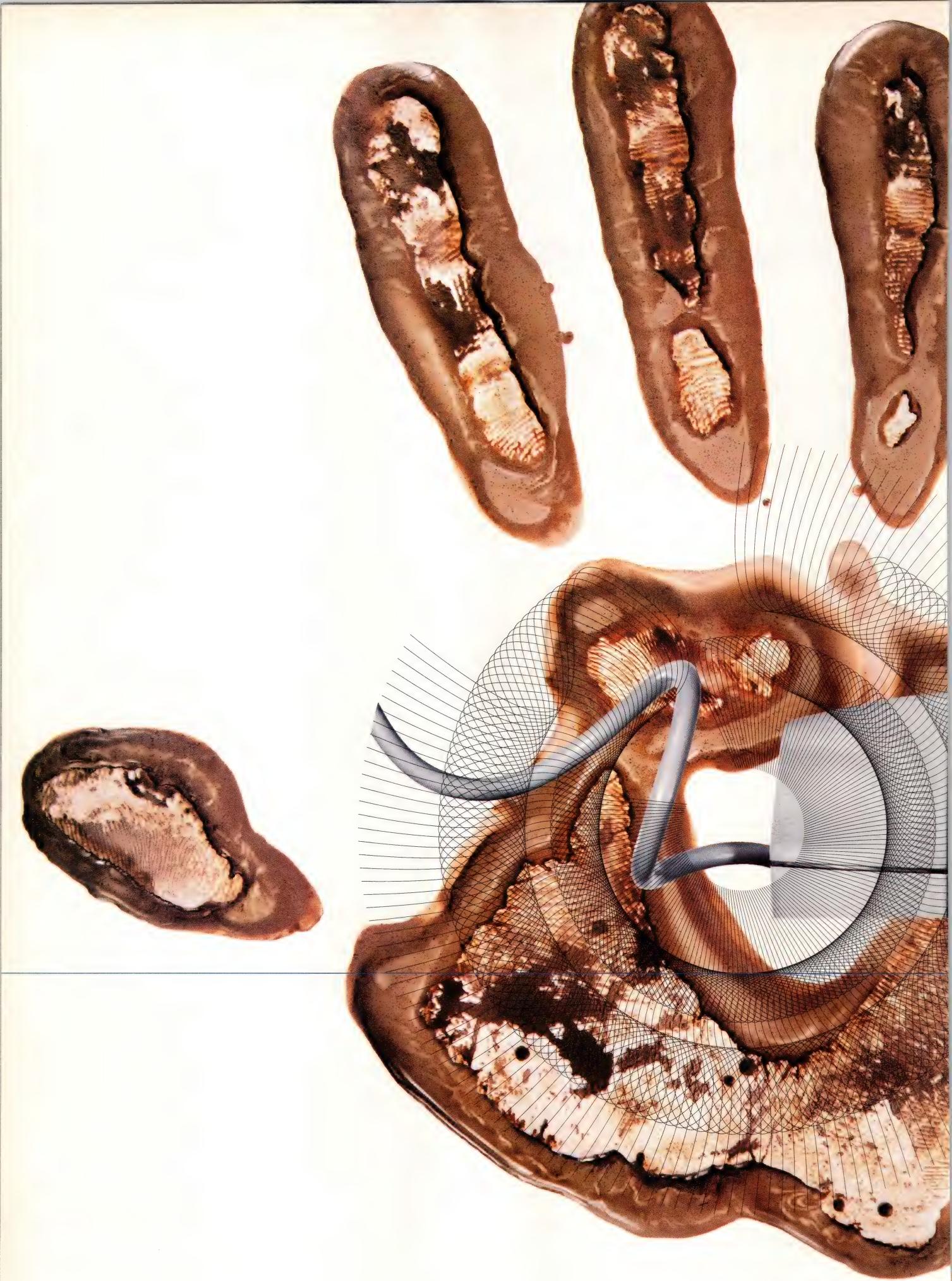
Then I found the Cobalt Qube 2700WG, a small box – the equivalent of about one and a quarter CD boxes in each dimension – with a translucent, dark blue plastic casing that is simply gorgeous; there isn't even a power switch to mar its beauty. You just plug it into the network, turn it on and after a few seconds it prompts you for a TCP/IP address using the dinky little LCD status panel mounted on the rear of the case. A few button pushes later it went off and booted itself. From that point on, all the configuration was carried out from a second computer, using a staggeringly simple Web-based interface. It only took 15 minutes at most to get everything up and running,

from taking it out of the box to being completely configured. The Qube's core operating system is Linux and it has all the underlying technology you might possibly need – an email server, Web server, ftp server, DNS and the rest. The processor is a 150MHz MIPs RISC chip, and with 32Mb of RAM and 6Gb of hard disk it has more than enough oomph to keep you happy.

So why am I telling you all this in the Advanced Windows column, when all things Linux are the province of El Beardo Evnul over in the Unix camp? I'm totally taken by this product because of what it delivers, and because it's one of the first serious attempts at a 'computing appliance' on the server side that actually works – which renders the fact that it's running Linux irrelevant. What's important is that the vendor has taken a two-pronged strategy, working out how to achieve remote Web-based control and configuration with all the tools you need, and then coupling it to hardware that has been specifically designed for the task in hand. It's this dual approach that makes the Qube so stunningly effective. Again, though, this still isn't really the stuff of a Windows column, despite the Qube's sparkling talents.

But where it does suddenly enter the frame is the fact that it also has an SMB server service built in, so it will appear in my NT and Windows 98 workgroup as just another machine. File sharing is trivial – you just drill into the Qube's shared space using the Network Neighbourhood icon on your desktop; if you want to ftp into it, you can do that too. It even supports AppleTalk so it can manage the same job with a Macintosh or in a mixed Windows/Mac environment.

Then it struck me: this is the first really sensible, commodity-priced server for growing workgroups in the Internet age. If you have a collection of, say, four or five Windows 95/98 machines, and you want to put an email server in, then you have some hard decisions to make. Do you slap in a large Intel box and buy the behemoth known as NT Small Business Edition? Sure, it will give you everything you need, but only by using industrial-strength technology like Exchange Server and SQL Server. Although the hardware required to make this run isn't that expensive, it is a hugely complicated solution to a relatively simple problem – Web, email and storage. What the Qube offers is a one-stop, drop-me-in-the-network-and-go solution. Couple it to one of the new generation of dial-on-demand ISDN routers and a cheap ISDN connection to the Internet, and you suddenly have a grown-up email solution. Or maybe an ADSL connection, or a cable modem. Its Web server component can be used as your Web presence, if you have either an open pipe or a pipe that



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A photograph of a hand holding a pencil, drawing a spiral line on a piece of paper. The spiral line starts from the bottom left and curves upwards and outwards towards the top right. The hand is positioned on the left, and the spiral line is the central focus of the image. The background is a plain, light color.

A few million years ago, in a cave lit by dim sunlight,  
man first marked his presence in the world.  
Announcing his ambition using flesh and earth.

Several hundred thousand generations later,  
man's desire remains steadfast.

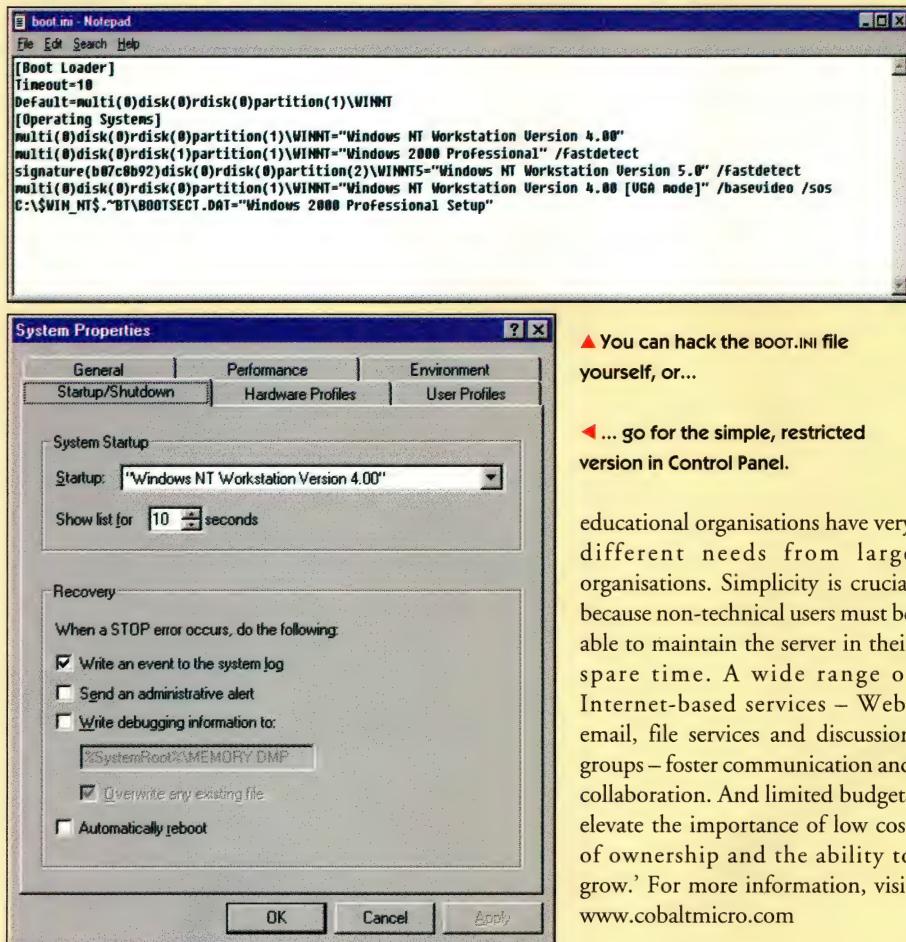
But the tools have gotten better. Smarter. Faster.  
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And in the process, they have left their own mark.  
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▲ You can hack the **BOOT.INI** file yourself, or...

◀ ... go for the simple, restricted version in Control Panel.

educational organisations have very different needs from large organisations. Simplicity is crucial because non-technical users must be able to maintain the server in their spare time. A wide range of Internet-based services – Web, email, file services and discussion groups – foster communication and collaboration. And limited budgets elevate the importance of low cost of ownership and the ability to grow. For more information, visit [www.cobaltmicro.com](http://www.cobaltmicro.com)

### Booting INI

While on the subject of configuring NT, it's about time I went through all the various options you can use on the elusive **BOOT.INI** file, the file on an NT machine which provides the front-end menu of operating system choices. This is as far as most people seem to get, but there is in fact a host of useful other settings tucked away in there that could well be useful.

First, you need to get at the file itself, which is just a text file but, assuming you have a relatively conventional installation layout, it's normally marked as hidden in the root of drive C. The command `'attrib -r -h -s boot.ini'` is useful for making the file available for twiddling – you don't have to reset the hidden attribute as NT will reset them for you next time you reboot anyway.

There are two sections in **BOOT.INI**. The first section is labelled **[Boot Loader]** and it sets two functions. Its first entry is **'Timeout'**, which is the number of seconds that counts down before the default selection is chosen, and the next entry is **'Default'**, which names the entry that will be used when that countdown timer expires.

The second section contains the meat of the file: each line specifies an installation of NT or some other Microsoft operating system such as Windows 98. Several lines can point to one

installation, and you can use this to have various preset settings for one master installation. The naming convention is tricky to understand because it's based on a naming convention which Microsoft dreamt up to work on RISC machines that don't have conventional PC-style boot sequence. So a boot installation of `multi(0)disk(0)partition(1)\WINNT` means use the first controller, disk 0, the first partition on it and the subdirectory called `\WINNT`. In the case of my machine, disk 0 is set up as drive 80h at boot time by the SCSI BIOS, because the PC starts numbering disks from 80h at boot time. So all that long naming convention means is 'use `c:\winnt`', which is where my installation is based.

Each line consists of a pointer to the boot directory, followed by an equals sign, and what appears on the right-hand side of the equals sign in quotes is the text that will appear on that line in the menu.

Therefore a line that says `multi(0)disk(0)partition(1)\WINNT="Windows NT Workstation Version 4.00"` puts up the text 'Windows NT Workstation Version 4.00' in the menu, and boots from that directory. What's interesting are the options you can put in on the right-hand side as switches on the boot line, as this is the real core of the matter. Each switch is preceded by a forward slash and then a keyword, and some of the keywords take a trailing equals sign and then a parameter.

The most interesting two options are `/SOS` and `/BASEVIDEO`. The `/SOS` option lists, on screen, all the core drivers as they're being loaded, which is useful if you change the machine configuration and want to check that the right drivers are being loaded (especially if the machine is hanging during that initial driver load sequence and you're not quite sure which one is responsible for the problem). `/BASEVIDEO` resets the machine to use the default VGA driver, which is always installed under NT; this is useful if you have your graphics card set to some high resolution and refresh rate, and then have to change the monitor and want to get back to a working system quickly. A typical example of this would be taking a machine to another site where you then wanted to use a VGA projector system.

The `/NOSERIALMICE` option disables serial mouse detection on all ports, and if you specify a COM port number after the statement, you can disable that port alone, which is useful if you have some odd device connected on a serial port and it mistakenly persuades NT it is a serial mouse during the boot sequence (a problem that crops up more frequently than you might imagine).

Now we come to the settings that are useful for specific cases only, in the realm of serious debugging and tweaking. `/MAXMEM` allows

can be opened automatically by a remote user out on the Internet. With 6Gb of disk space, you're not going to be serving up a network-shared installation of Office from the Qube, but there's no problem using it for shared file space.

The Qube's built-in software is also stunningly effective: not only is there an email and Web server, it also incorporates a full discussion server that can even thread discussion topics. There's a document search and indexing facility too, and Cobalt has just released a package which implements FrontPage Extensions, if that's your bag.

As you have probably guessed by now, I'm extremely happy with my Qube purchase. If you want a 1-U high rack-mount model, there's a version that does that too. For building Internet and Web services in a small workgroup environment, The Qube is a compelling solution that deserves consideration. It would even merit a place in the larger organisation, where you might want to push such technology down to the departmental level. And I have to say that it's a lot easier to administer than an NT Server with IIS and all the other Small Business Server technologies.

As the Cobalt people themselves say, 'When it comes to servers, one size does not fit all. Workgroups, small offices, branch offices and

# Getting onto the Internet, via Windows 95/98

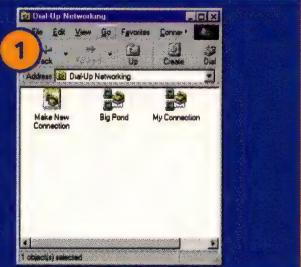
So you want to get onto the Internet?

Stephen Dawson gets you started in five easy steps.

## 1. Choose your ISP

Your Internet Service Provider will be your gateway into the virtual world. Things to look for include the obvious: pricing. Be cautious about flat rate pricing, unlimited by time. It may sound cheap, but it can be difficult to get a connection if everyone else remains logged on.

Experiment with ISPs. Take advantage of free offers. Use several and see which provides the best service. If you intend to travel, choose an ISP that has local-call access available at most of the places you'll be going. Make sure the deal includes server space for your own Web page - there's no better way of learning than doing it yourself.



## 2. Choose your software

To make use of the Internet you will need at least a Web browser, an email 'client' and a newsgroup reader. But which ones to choose? For a browser, try one of the two dominant products: Microsoft Internet Explorer and Netscape Navigator. Both are free. There are others, including the highly regarded Opera. But many Web page designers fail to make allowances for older browsers. If your browser doesn't support, say, frames, there are pages you simply won't be able to access.

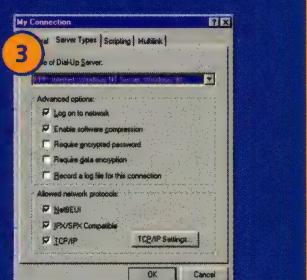
Microsoft and Netscape also provide email and newsgroup programs bundled with their browsers. Better features come with purchased products such as Forté Agent, Eudora Pro or Microsoft Outlook.



## 3. Configure dial-up connection

For Windows 95/98 you must have Dial-Up Networking (DUN) installed (Figure 1). Double-click 'My Computer'. If there is no folder by that title, select Settings|Control Panel from the Start menu and then start Add/Remove Programs, select the Windows tab and choose Communications. Tick the DUN box and follow the instruction.

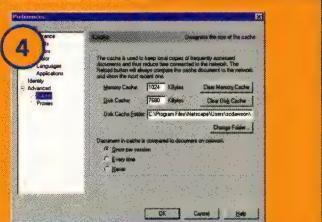
Many ISPs will provide you with a CD-ROM to streamline the connection process but you can do it yourself. Double click the DUN folder, and then the 'Make New Connection' icon. This brings up a wizard to guide you through the connection (Figure 2). Under Windows 98 the only information you need from your ISP is its telephone number. This should get you on to most ISPs but if not then talk to your ISP. Further information may need to be added by right clicking on the icon the wizard has created and selecting Properties (Figure 3).



## 4. Configure your software

If you're using Netscape, soon after starting you should select the Edit|Preferences option. This allows you to configure several things, including specifying whether you'll permit the ubiquitous cookies to be deposited onto your hard disk, and indicating how much disk space you'll allow a record of your Internet travels to consume (Figure 4). With Explorer these, and others, are under View/Internet Options (Figure 5).

With your email program, make sure its options include your return email address. If you want to avoid spam, include a spoiler! If you do, use text in your emails to let people know how to contact you.



## 5. Make yourself independent

What if your ISP begins to treat you like dirt. Isn't changing ISPs too much hassle? Doesn't it mean having to tell everyone to change your email address from dissatisfied@nogoodisp.com.au to dissatisfied@betterisp.com.au? Not really. There are sites, such as <http://www.iname.com>, where you can get a free email address. This redirects email. People write to me at scdawson@iname.com. This address simply bounces the email to an address I've specified. Any time I can change ISPs, go to the iname site and give it the new address to which to forward my email.

Now that you're up and running, start by going to <http://pcauthority.ajb.com.au> where you can keep up to date with our reviews archive, daily IT developments and win a prize or two.



you to restrict NT to use just the amount of memory you specify – good for testing for restricted RAM conditions without having to pull out any DIMMs. Similarly, /BURNMEMORY allows you to tell NT to forget about a specified amount of RAM. /ONECPU tells the system to use only one processor in an SMP environment, which is useful if you have a badly-behaved application that can't cope with an SMP environment; while its companion option /NUMPROC allows you to specify how many processors will be used on an SMP machine without having to pull any processors chips out.

/PCILOCK tells NT not to automatically assign resources to devices on the PCI bus, but to use the BIOS defaults instead. This is something NT normally gets right, but you might encounter circumstances where manual control is required. /3GB switches the OS/application memory split from 2Gb/2Gb to 1Gb/3Gb in NT 4 Service Pack 3 or later, and requires three special conditions: you really need 3Gb of physical RAM in the machine (preferably 4Gb); you need to be running the Enterprise version of NT 4; and you need to use 3Gb-aware applications, otherwise it won't be of any help whatsoever.

The remaining switches (/NODEBUG, /CRASHDEBUG, /DEBUG, /DEBUGPORT, /BAUDRATE, /KERNEL and /HAL) are really aimed at the serious developer who has the 'checked' build of NT installed and wishes to modify the way in which it works. Day-to-day users won't need to go anywhere near them.

As you can see, there's a lot going on in that *BOOT.INI* file, and it's worth being clear in your mind as to which settings are useful. Finally, I should give a plug to the excellent NTInternals Web site ([www.ntinternals.com](http://www.ntinternals.com)), which is where I cross-checked this information, and found a few new switches I wasn't aware of too. The company offers a range of very useful tools and it's a site well worth keeping an eye on. For example, remember when I recently bemoaned the upgrade cost from Diskeeper 3 to 4, when the only difference is that the newer version can do paging file defragmentation? Well, the NTInternals crew has written a little boot-time page file defragmentation tool that also defrags the Registry files, and it's free – so now you know where to get your Diskeeper 'upgrade' from.

### Consistency?

When I typed the words 'cross checked' (minus the hyphen) into that last paragraph, Word 2000 underlined it with a wiggly green line to indicate it was incorrect. When I right-clicked on the words, it suggested 'cross-checked' instead. I selected that, and Word then underlined this replacement and said that



Be afraid, be very afraid – L0pht just got 400 per cent faster...

was wrong too. So I right-clicked on it and it threw up 'crosschecked', which it at last was happy with. I do like straightforward software that has a clear, consistent view of the world.

### More L0phtCrack

It seems my recent coverage regarding NT password-cracking went down extremely badly with certain readers, some of whom got very upset because I told you how to run these tools, where to get them and how they worked. They were deeply upset that their networks could now be susceptible to attack. Well yah boo, sucks to 'em all, I say. Security through obscurity is no security whatsoever. Let me quote from one letter writer:

'I am not too thrilled with your recent coverage of L0 Crack, not in what it does but the fact that it has been named and the source URL given. I would like to point out that the site, and sites linked, have a plethora of hacking, cracking and phreaking tools.'

He then goes on to say: 'As is the case of many other admins, it is not my full-time job. I have a minimum of two of these at any one time! I must now try and devote more time to auditing the network – naturally at the expense of my primary role(s), or do I just work evenings for the hell of it? No way, that's when I devote time to my family – and learning more about NT and networking.' And it gets better: 'Although this wasn't my decision, users of our network have administrative powers locally so they can load/unload drivers and services and therefore have great scope for damage by use of these programs with little chance of detection.' Then a kindly word: 'Superb column, well presented and very informative. I just happen to think this one piece is out of line. Or was it meant to provoke such a reaction? There are many unhappy admins out there now, and no doubt far many more users with bright and very dangerous ideas.'

Unfortunately, at this point it all went horribly wrong: he claimed, in passing, to work for the UK's Ministry of Defence (I will

save the gentleman's blushes by not naming him). Nice to know isn't it, Miss Moneypenny, that the MoD has such a strict and sensible view of security that people with access to important computer networks have administrative powers locally, and that the (part-time) person responsible for one of their networks is now worried that his users will use tools like L0phtCrack as a result of what I wrote? Maybe things were better in the days when the Russians were the real enemies and our people had real work to do. Well, I've got bad news for you, Peter. Oops, or was it James? L0pht has just released a new version of the engine, release 2.5.1. It's even better optimised for cracking and is apparently now 450 per cent faster and will do a dictionary attack with numbers tacked on the end to tackle the easy 'fred21'-type passwords.

As for myself, I have a confession to make. Back in issue 16, I showed a screenshot of L0phtCrack running on my network, but I had taken the time and care to obscure the information in the window using the 'smudge' command in Photoshop. So you can imagine my surprise when my good friend Piers Cawley telephoned me and told me that close and careful examination of the printed screenshot revealed my Administrator password as 'wibble32'. Before you even think of it, I have completely stripped down my network and reissued new passwords across the board. I had fully intended to do this before issue 16 was published, but Christmas got in the way so the subscribers received their copies a week earlier than I anticipated. Nevertheless, hats off to Piers and a bottle of Bollinger is en route. ☺

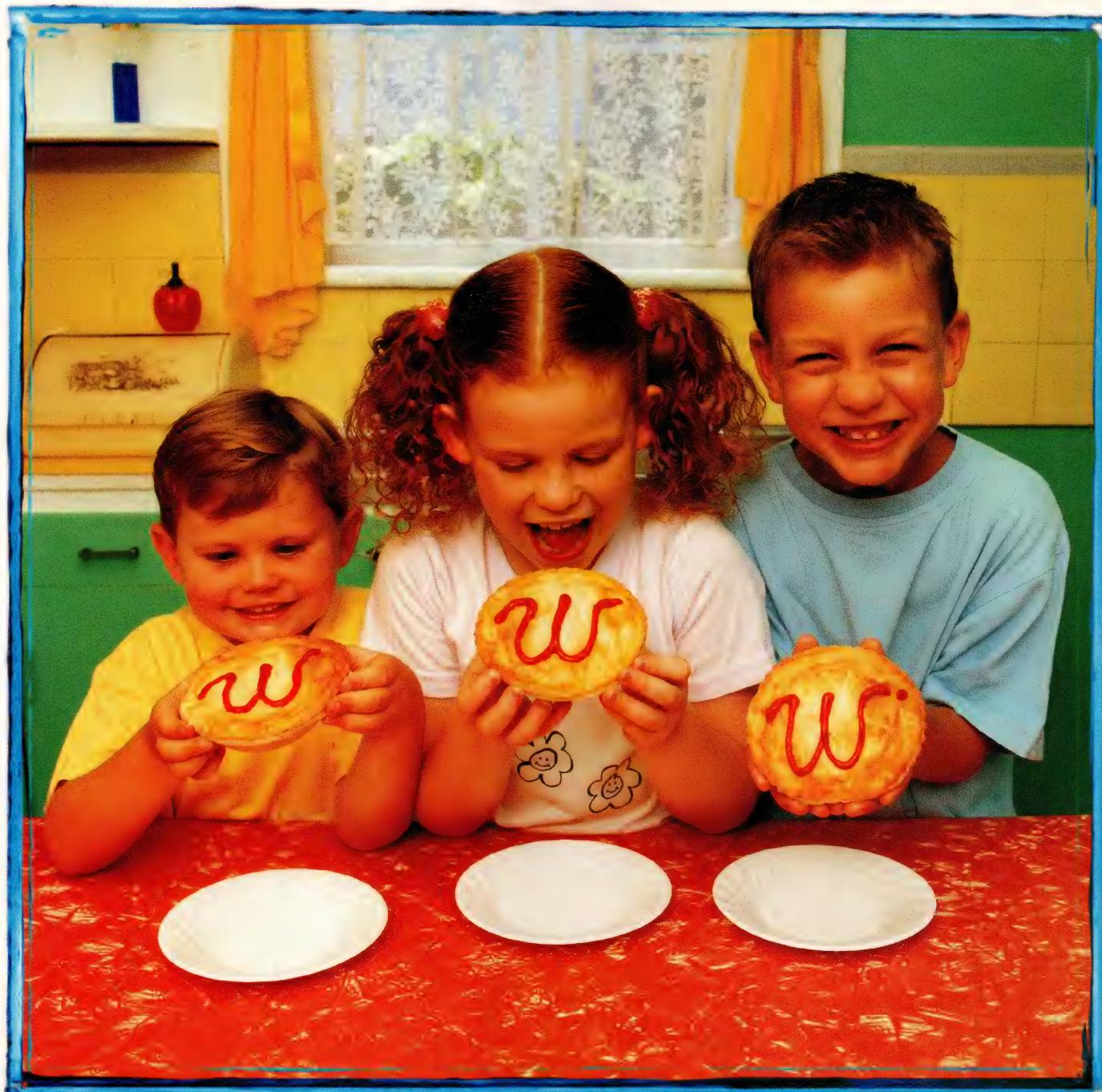
### Jon Honeyball



Computer journalist and consultant specialising in both client/server and office automation applications.

### Contact

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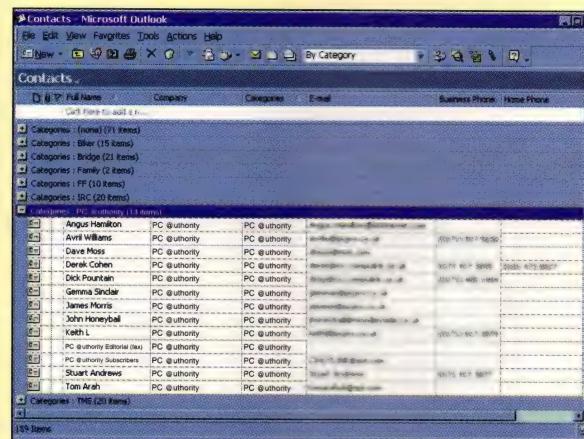
# OUTLOOK TRICKS

SIMON JONES FINDS AN EASY WAY TO EMAIL SELECTED CONTACTS IN OUTLOOK, AND UPGRADES HIS FONTS WITH THE NEW EURO SYMBOL.

A reader has emailed me to ask if there is an easy way to set up distribution lists in Outlook. She'd already marked her contacts with various categories and didn't want to create mail groups or distribution lists that would need maintaining on top of these. What she wanted was a way of typing a category or two into the 'To' field on an email and then leave it up to Outlook to add all the email addresses of contacts matching the categories. Well, there are many ways to skin a cat, but that isn't how Outlook handles this particular problem. In Outlook, if you want to do something to a lot of items in one hit, you have to select the items first, rather than tackle the 'something' first.

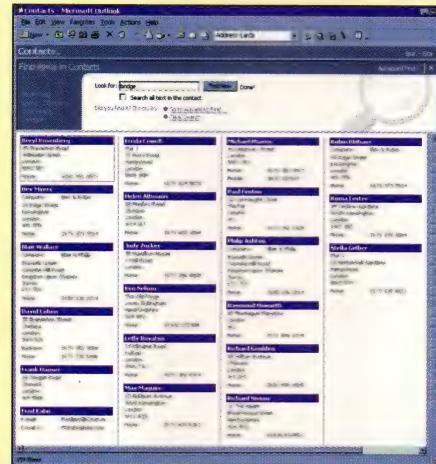
The simplest way to send an email to everyone in a category is this: open the Contacts Folder and choose View | Current View | By Category from the menu. Click on a category header to select it and then choose Actions | New Message to Contact. Outlook will create a new email and add all the selected contacts into its To field (you will receive a warning message if some of the selected contacts don't have email addresses). You can select multiple categories by clicking on one and then holding down the Control key while clicking on other categories.

For more sophisticated selections, you can use the Find or Advanced Find functions, and you can do this from any view. Choose Tools | Find from the menu and the Find form will



Contacts by category with one category selected.

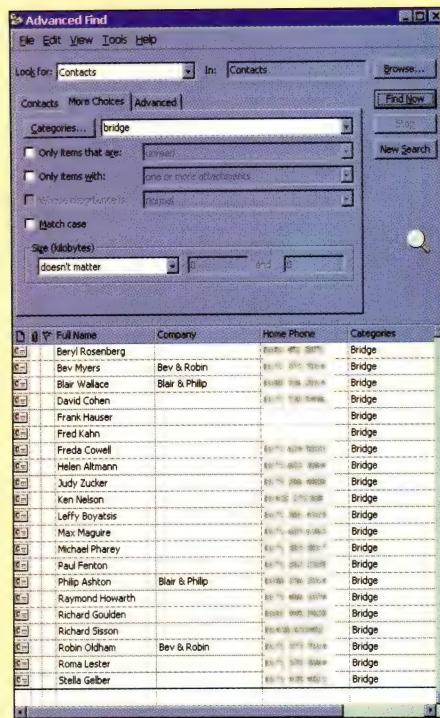
unroll at the top of the contacts window. This will search in the Names, Addresses, Company and Categories fields or, if you tick the box, in all the text in your contacts info. This



Using Find to select all contacts in a category.

way, you can search for a company name that may be held in the address, company or category fields. When you press the Find Now button, Outlook filters out all the records that don't match. Now choose Edit | Select All from the menu (or press <Ctrl-A>) and Outlook should highlight all the contacts that remain in the window (you may have to select one contact first and then press <Ctrl-A> again). Once the contacts are highlighted, choose Actions | New Message to Contact from the menu as before. You can always <Ctrl-Click> on any of the highlighted contacts to deselect before creating the message.

If you need more control over which contacts are selected, use the Advanced Find option on the Tools menu (or press <Ctrl-Shift-F>). On the More Choices tab you can type the categories you want to search for, or click the categories button and tick which categories you're looking for. You can enter more sophisticated criteria on the Advanced tab – for instance, you can add a criterion that the E-Mail field must not empty. Click the Fields button and choose E-Mail fields and E-Mail from the pop-up menus. In the Conditions combo box, choose Is not empty and then press the Add to List button. This will exclude those contacts who don't have an email address. Press the Find Now button and Outlook will list all those contacts that match the criteria. Choose Edit | Select All from the menu or press <Ctrl-A>. Now drag the selected contacts to your Inbox folder. Dropping the contacts on the Inbox in the folder tree will



### Using Advanced Find to do the same.

create a new email message to all contacts.

This concept of dragging and dropping an item to create a new item applies to many areas in Outlook – only one new item will be created, even if you drag a list containing multiple items. The item you drag will not be moved if you drag it into a folder that contains a different type of item. For instance, if you drag a meeting request or task request from your Inbox onto Calendar or Tasks, the request is automatically accepted and an acceptance reply sent to the sender. Dragging a contact onto the Tasks folder creates a task request and assigns it to that contact, while dragging a contact to the Calendar creates a meeting request. (However, if you drag, copy or move an item to a folder that contains items of the same type, the item will just be copied or moved as usual.) These actions also occur if you choose Copy to Folder or Move to Folder from the Edit menu

## Reader's tip

**B**arry Markham emailed me with two useful little macros he'd written for PowerPoint. He found that when designing presentations, he often had to change the layout of slides from one column of bullets to two and back again. This meant several steps for every slide; just changing the layout didn't move the text. He wanted a way of splitting and combining the text, so he rehearsed what he wanted to do several times, then recorded a pair of macros to do the task for him. With a little tidying up, he produced macros that worked under virtually any circumstance. Here they are.

The first macro splits one column of text into two. Select the text to be moved, then run this macro. It cuts the text to the clipboard, changes the layout to two columns, selects the second column and pastes the text into it. The second macro reverses the process. The text in the second column is selected automatically and cut to the clipboard. The slide layout is then changed so that it has just one column, while the contents of the clipboard are inserted at the end of the left-remaining text box. By assigning these macros to buttons on the toolbar, Barry could now easily rearrange the text on his slides. Judging by his heading, I suspect Barry might be a closet Spice Girls fan, but we'll forgive him that.

## Code

### Listing one

```
Sub OneBecomesTwo()
    With ActiveWindow.Selection
        .Cut
    End With
```

but then select a folder containing a different type of item. The table above shows what happens when you drop each particular item type onto a different folder. Some of the actions are more useful than others, and I've highlighted these in red.

```
With .SlideRange
    .Layout = ppLayoutTwoColumnText
    .Shapes(3).Select
End With

With
    .ShapeRange.TextFrame.TextRange
        .Select
        .Characters(Start:=1, Length:=0).Select
    End With

    ActiveWindow.View.Paste
    .Unselect
End With

End Sub

Sub TwoBecomeOne()
    With ActiveWindow.Selection
        .SlideRange.Shapes(3).Select
    End With

    With
        .ShapeRange.TextFrame.TextRange
            .Select
            .Characters(Start:=1, Length:=0).Select
    End With

    .Cut

    With .SlideRange
        .Layout = ppLayoutText
        .Shapes(2).Select
    End With

    With
        .ShapeRange.TextFrame.TextRange
            .Select
            .Characters(Start:=.Length, Length:=0).Select
            .InsertAfter Chr$(CharCode:=13)
    End With

    With
        .ShapeRange.TextFrame.TextRange
            .Characters(Start:=.Length, Length:=0).Select
            .InsertAfter.Paste
    End With

    .Unselect
End With

End Sub
```

### Euro-enabled fonts

The euro may at present be only available in electronic form rather than coins or notes, but it is still going to have a great impact on Europe and on the financial world as well. Now that the euro is a reality, Microsoft has released a second batch of fonts containing the relevant symbol. These new fonts are Arial Black, Arial Narrow, Book Antiqua, Bookman Old Style, Century Gothic, Comic Sans MS, Garamond, Haettenschweiler, Impact, Monotype Corsiva, Trebuchet MS and Verdana. The new update is a file called OFFTTUPD.EXE and it's available on the Microsoft Web site at <http://officeupdate.microsoft.com/downloadDetails/offeurofonts.htm>

Before you install the fonts remember that you may need an update for your OS – it's built in to Windows 98, but Windows 95 and NT users should visit [www.microsoft.com/windows/euro.asp](http://www.microsoft.com/windows/euro.asp) for new versions of Times

Drag item type to folder	Calendar	Contacts	Inbox/Outbox	Journal	Tasks
<b>APPOINTMENT</b>	Copy/Move	Create Contact	Create Message	Create Journal Entry (meeting)	Create Task
<b>CONTACT</b>	<b>Create Meeting Request</b>	Copy/Move	<b>Create Message to Contact</b>	Create Journal Entry (phone call)	<b>Create Task Request</b>
<b>JOURNAL ENTRY</b>	Create Appointment	Create Contact	Create Message	Copy/Move	Create Task
<b>MESSAGE</b>	Create Appointment	<b>Create Contact for Sender</b>	Copy/Move	Create Journal Entry (email message)	Create Task
<b>MEETING REQUEST</b>	<b>Accept Meeting</b>	Create Contact	Copy/Move	Create Journal Entry (meeting request)	Create Task
<b>TASK</b>	Create Appointment	Create Contact	Create Message	Create Journal Entry (task)	Copy/Move
<b>TASK REQUEST</b>	Create Appointment	<b>Create Contact for Assignee</b>	Copy/Move	Create Journal Entry (task request)	<b>Accept Task</b>

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<b>VIDEO CONFERENCING</b>	✓	✓	✓	✓	✓
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<b>VIDEO EDITING</b>	✓	N/A	N/A	✓	N/A
<b>SECURITY via PC Snoop SW</b>	N/A	✓	N/A	N/A	N/A
Surveillance		✓			
Watch Dog		✓			
Secretary		✓			
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Max. Resolution	640 X 480	640 X 480	768 X 576	640 X 480	768 X 576
<b>DISPLAY RESOLUTION :</b>					
Max. Resolution	640 X 480	640 X 480	1600 X 1200	640 X 480	1600 X 1200
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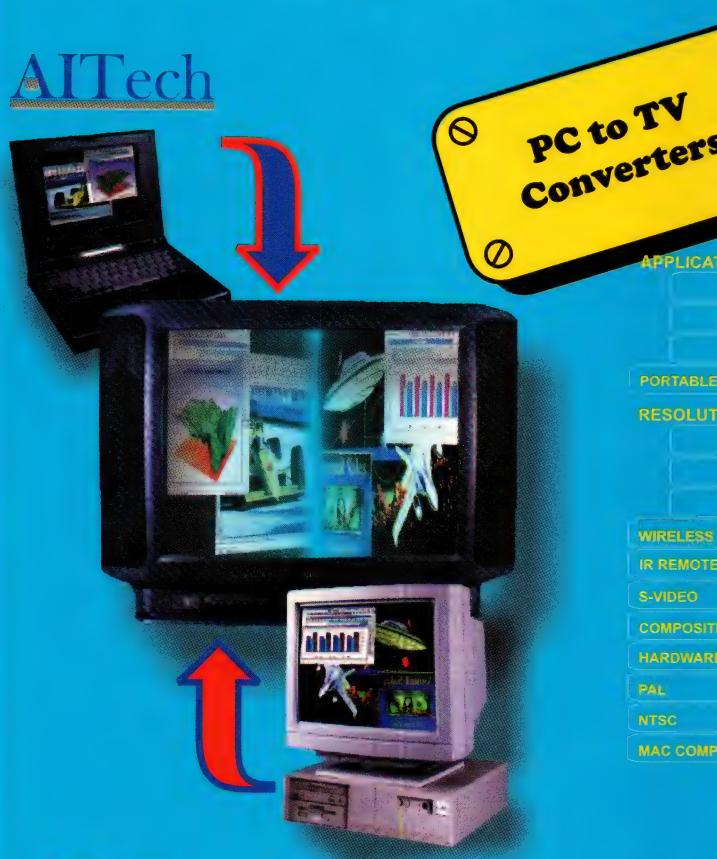
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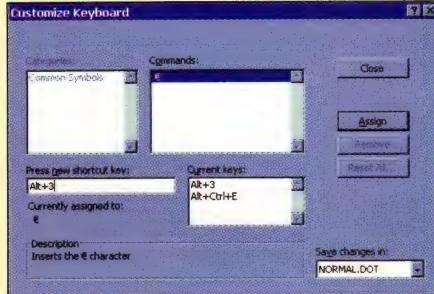
2  
0  
2  
0



Ulead



Listing all the fonts installed on a PC.



Assigning keyboard shortcuts to the euro symbol.

New Roman, Arial, Courier New and Tahoma.

Once you have the euro symbol, you can activate it by holding down the Alt key, pressing 0128 on the numeric keypad and then releasing Alt. In Microsoft Word, you can use the Insert Symbol dialog to assign the character to something more memorable such as <Alt-3> (<Shift-3> is the pound symbol on UK keyboards, so <Alt-3> as the euro should work for most people).

Choose Insert | Symbol from the menu. In the Font dropdown, choose '(normal text)' at the top of the list. In the Subset dropdown, choose Currency Symbols. The ? symbol is three blocks right of the \$ sign – select this and then click on the Shortcut Key button, press <Alt-3> and click Assign. Click the Close button on the Customise Keyboard dialog and then Cancel on the Symbol dialog. Assign the euro symbol to any keys you wish.

To find out which of the fonts installed on your PC



The euro in all 22 fonts.

# Code

## Listing two

```
Public Sub ListEuroFonts()
```

```
Dim vntFont As Variant
Dim intCount As Integer
```

```
Let intCount = 1
```

### 'List all the fonts'

```
For Each vntFont In FontNames
```

```
With Selection
```

```
.TypeText intCount
.TypeText Chr(9)
.Font.Name = vntFont
.TypeText Chr(128)
.TypeText Chr(9)
.TypeText vntFont
.TypeText Chr(9)
.Font.Name = "Courier New"
.TypeText vntFont
.TypeText Chr(13)
End With
```

```
Let intCount = intCount + 1
Next vntFont
```

### 'Select the whole document'

```
Selection.HomeKey Unit:=wdStory,
Extend:=wdExtend
```

### 'Convert to a table'

```
Selection.ConvertToTable
Separator:=wdSeparateByTabs, _
NumColumns:=4, NumRows:=
intCount - 1, _
Format:=wdTableFormatNone,
ApplyBorders:=True, _
```

```
Let intCount = intCount + 1
Next vntFont
```

### 'Go to the beginning'

```
Selection.HomeKey Unit:=
wdStory
```

```
ApplyShading:=True,
```

```
ApplyFont:=
True, _
```

```
ApplyColor:=True,
```

```
ApplyHeadingRows:=True, _
```

```
ApplyLastRow:=False,
```

```
ApplyFirstColumn:=True, _
```

```
ApplyLastColumn:=False,
```

```
Autofit:=True
```

### 'Sort the table'

```
Selection.Sort ExcludeHeader:=
False, _
```

```
FieldNumber:="Column 4", _
```

```
SortFieldType:=
wdSortFieldAlphanumeric, _
```

```
SortOrder:=
wdSortOrderAscending, _
```

```
Separator:=
wdSortSeparateByTabs, _
```

```
SortColumn:=False, _
```

```
CaseSensitive:=False, _
```

```
LanguageID:=wdEnglishUK
```

### 'AutoFit to Contents'

```
Selection.Tables(1).AutoFormat _
Format:=wdTableFormatSimple1,
```

```
—
```

```
ApplyBorders:=False, _
```

```
ApplyShading:=False, _
```

```
ApplyFont:=False, _
```

```
ApplyColor:=False, _
```

```
ApplyHeadingRows:=False,
```

```
ApplyLastRow:=False, _
```

```
ApplyFirstColumn:=False,
```

```
ApplyLastColumn:=False, _
```

```
Autofit:=True
```

```
—
```

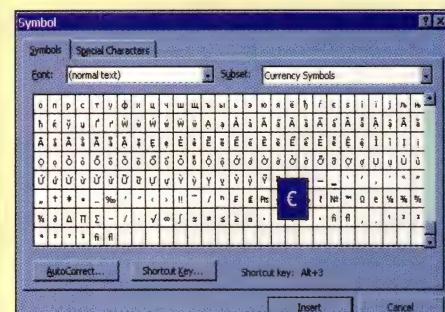
### 'Go to the beginning'

```
Selection.HomeKey Unit:=
wdStory
```

```
End Sub
```

have the euro symbol, run the following code in Word. The first column of the resulting table is the number of the font in the FontNames collection and, providing that particular font supports it, the second column should contain the euro symbol. If there is just a solid or outline block, that font does not contain any symbol for character 0128. Some special fonts such as Wingdings may show other symbols. In the third column is the name of the font, reproduced in the actual font itself. The last column shows the name again, this time in Courier New (in case the actual font is unreadable, such as Wingdings).

The code that produces this table is simple: I use the For Each construct to loop through all the fonts in the FontNames collection and, as I do this, I call the TypeText method to put the words and numbers into the document. A tab character separates each



Insert Symbol dialog with 'euro' highlighted.

column from the next. I then select the whole document and convert it to a table, sort the table, then the column widths are adjusted to fit their contents. Finally, I move the insertion point to the top of the document. ☺

## Simon Jones

IT consultant specialising in Visual Basic, SQL Server and MS Office integration. Lives with a Gordon Setter and a large motorbike.

### Contact

Email pc@uthority.ajb.com.au



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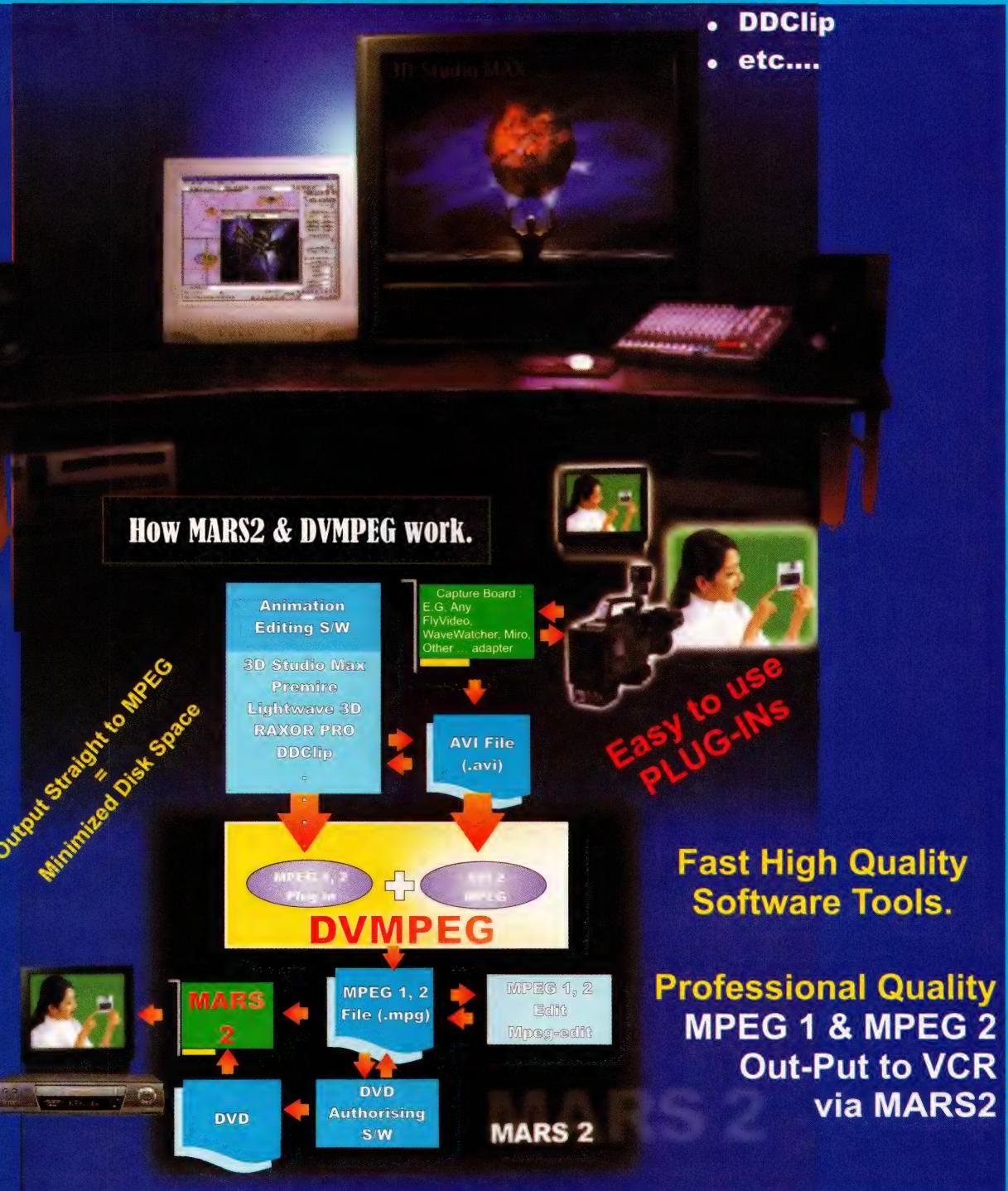
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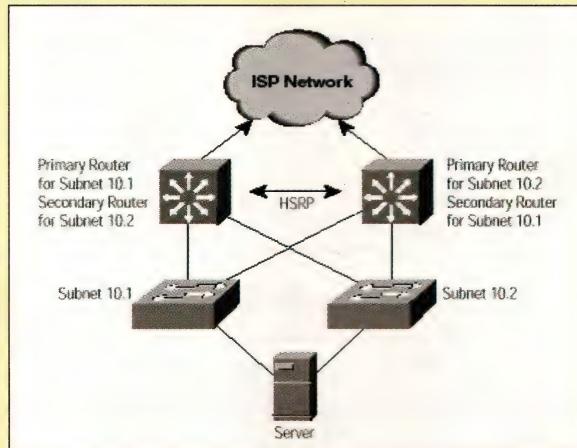
# NEW YEAR CHECKLIST

PAUL OCKENDEN AND MARK NEWTON GET YOUR WEB SITE Y2K COMPLIANT AND LOOK AT THE BENEFITS OF A SECOND LEASED LINE.

Now we're in the last year of the millennium you'll have checked that your Web servers and associated machines and equipment are all Y2K compliant. Right? But how far did you go in that testing? Did you simply run one of those Y2K test programs that come free on most magazine cover discs these days, and then accept its report that your machine is Y2K safe? If so, you'll almost certainly need to dig a little deeper to ensure that your Web sites really will survive into the next millennium. All the little test program will have checked is that the Real Time Clock and the BIOS in your servers can cope with the century changeover. It won't have checked your Web site itself.

Since each Web server will be different, this has to be a manual task. Here's a list of ten things you may have missed:

- 1 Check any dates displayed within the static HTML of your Web sites – things like 'Offer expires June 1999' and 'Copyright ©1996-99 XZY Ltd'. If you're going to be fully Y2K compliant, you should cover all the simple things like this.
- 2 Check all of your scripts, be they Perl-based CGI, ASP, JavaScript or whatever. Wherever the script checks or manipulates date data, you need to check for Y2K compliance. One particular area to inspect is any form field validation code. For example, you might have an order form used to subscribe to a magazine or



Check Y2K compliance with your software vendors.

a service, and it may check that the subscription start date entered by the user is greater than today's date. Such code will obviously fail if it employs a two-digit year representation. In fact, such a bug could start affecting you this year, rather than after the millennium.

3 Check any databases that your Web applications read from or write to. What formats are their dates stored in? Is the database backend Y2K friendly? Also, while you're at it, set the database date formats to one which uses the month name rather than the number (for example, in Access use MediumDate rather than ShortDate). That way you'll avoid any of those silly US (mm/dd/yy), European (dd/mm/yy) and Japanese (yy/mm/dd) date format conversion problems.

4 Check that your Web server software is

generating log files that are Y2K compliant. We've seen no end of log files that contain two-digit year values.

5 Then check that your log file analysis software can cope with these log files. Some of the 'free' products out there seem to have problems in this area. We're going to cover the general quality (or lack of it) of log analysis and auditing software in a future issue, but for now just check that your software doesn't think previous visitors have suddenly become 'new' again after the end of 1999.

6 Can your server track sessions across the date change? If not, you'll have to decide whether it's a problem that needs to be fixed or not. One argument is that session tracking is a small thing, and

anyone sad enough to be surfing the net at the end of the century deserves all the problems they get, however...

7 Some companies may be holding live new year Web events on their sites. If you host such a site, your clients will want assurances that it will work properly.

8 Also, there will be genuine net users online at that time, including journalists who are checking to see which sites have failed. What will your boss or your clients think of a lovely big screenshot of your broken site, printed in the millennium's first issue of *PC Authority*?

9 Returning to those sad surfers for a moment; someone may want to be the first person, for example, to place an order with a particular retailer in the new millennium. How would they feel if at midnight, just as they were

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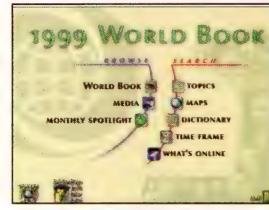
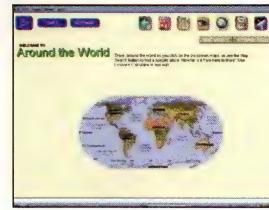
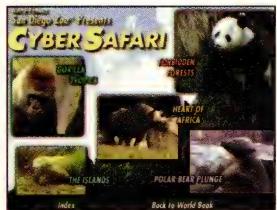
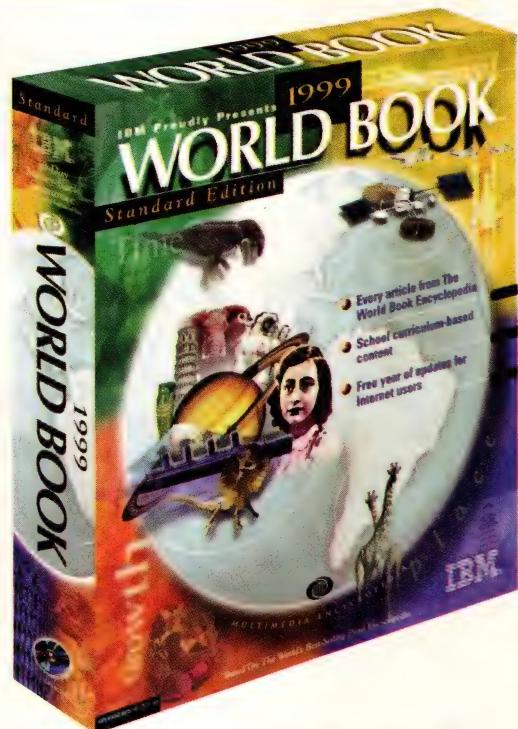
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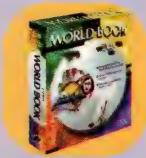
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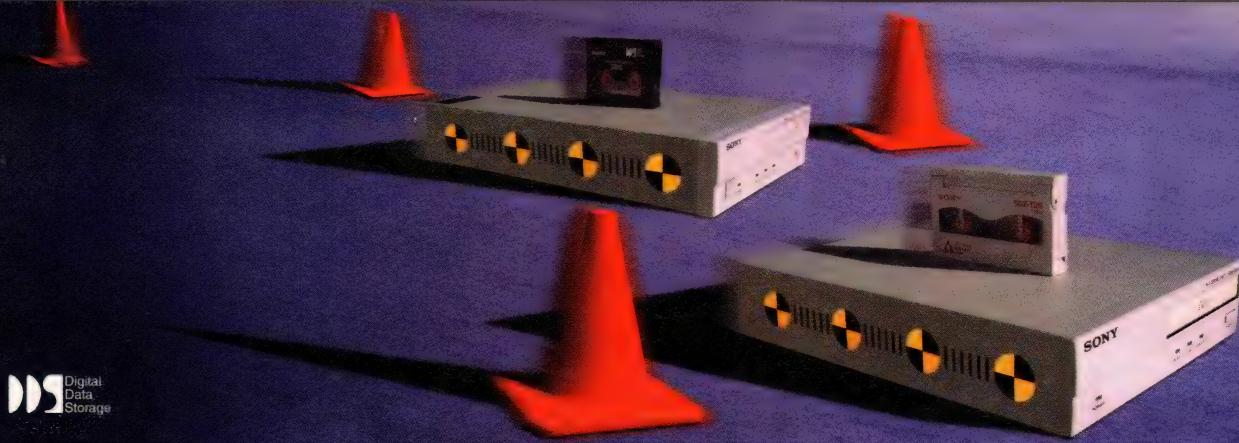
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about to click the Send Order button, the server lost track of its sessions, and their shopping basket suddenly became empty?

10 Last, is your operating system and Web server certified as Y2K safe by the software vendors? If you're running NT-based servers, for example, you'll need to have Service Pack 4 installed.

### Idiotic FrontPage (again)

Okay, we know we're always moaning about FrontPage 98, and it does get rather tedious, but we came across such an amazing bit of stupidity the other day that we can't be silent. You know that links are coloured on Web pages and that, after you've clicked one, it changes colour. Well, we were designing a site and noticed that the links weren't changing colour – this was happening in IE 4 and 5, and Navigator 3 and 4. We discovered this HTML for the links in question:

```
<p align="center">
<a href="Overview.htm">
<font face="Arial" color="#008000">
Company Overview
</font>
</a>
</p>
```

Now you see the problem, don't you? The href tag is outside the font tag. This means the font tag settings are overriding the colour change that href is trying to make when the link gets visited. If the code is corrected it all works fine.

So now you'll be asking, 'How do I stop FrontPage 98 generating broken code like that?' And the answer is that you can't. FrontPage shouldn't allow code like this, and the reason it generates one version rather than the other seems to depend on the order links and colours are applied. This is one of the most frustrating bugs we have found in FrontPage so far. It means every link that doesn't use a graphic needs to be checked – and if necessary changed – by manually editing the raw HTML. This isn't a job the average FrontPage user wants to do, and nor should they have to.

### Second line, second ISP?

If you host your Web sites in-house, it's a certain bet that at some stage your leased line will start to fill up and need to be upgraded. All lines will 'max out' at times but, when Web site performance starts to suffer and visitors or clients start to get annoyed, some remedial action is usually required. There are a number of options available. You could increase the capacity of your existing line; in most cases this will be a simple procedure, just as if your ISP and telco have 'turned up the volume'. This is the fastest and also the cheapest option.

However, in addition to adding extra bandwidth, you could use this upgrade as a way to improve your resilience against failures. You

can do this by taking your extra bandwidth via a second leased line, which might come from your existing ISP or be bought in from elsewhere. Whichever option you take there are some important rules to follow:

- Your existing line is almost certainly delivered to your building by Telstra, Optus or one of the smaller cable companies. Ensure that a different telco than the one which supplies your existing line delivers the new one. One thing to beware of here is that Telstra can have fairly long lead times for its new line installations.
- Of equal importance is making sure that the new line enters your building in a different place to the existing one. That way, if a truck demolishes a corner of the building, or someone digs up the pavement outside, you'll hopefully only lose service on one of the lines. A true story: a friend of Paul's was having a second line installed but neglected his advice on this matter. As the contractors were outside digging up the pavement to install the second line, you've guessed it, they cut right through the first one! He had complete loss of service for over a week.
- If you buy the new line from your existing ISP, make sure it supplies one from a different remote POP.

Given the choice of a new line from your existing ISP or one from an alternative supplier, is there an obvious choice? At first sight you'd appear to have more protection by shopping elsewhere. However, when Paul was faced with this choice recently, he ended up taking the second line from his existing provider. Why? Well, when one of your lines fails, you're going to have to make everything run through the other line. Each line will have an associated address block (probably a class C), so you could manually reconfigure all of your machines to use an address in the appropriate block and to use the other router as the default gateway. However, if you have a large number of machines or virtual servers, this could take some time and has the makings of an administrative nightmare. It also requires someone on site at the time to make the changes, and it will all need to be reversed when the other line comes back on stream. This isn't exactly ideal.

However, your ISP probably has links to many other providers, and they seem to manage to reroute things if a route fails. How do they do it? Well, they'll have something called an autonomous system number, or ASN, and be running something like BGP (Border Gateway Protocol). We'll spare you the boring details, but suffice to say that these allow organisations to join in with the big boys of the Internet by automatically routing traffic via different routes as required. The trouble is, the big boys like to keep their club fairly exclusive – you almost certainly won't have enough of an address requirement to get a block of addresses big enough not to be treated as 'an annoyance'

by many of the bigger ISPs, especially in the US. When this happens, they'll simply ignore your routing instructions.

If you take your new line from your existing ISP, however, it can take care of line failures for you. Your on-site routers (assuming they are Cisco, and why would anyone use anything else?) can be configured to run Hot Standby Router Protocol, or HSRP. This allows one router to monitor the function of the other and, if it detects a problem, to take over all of its functions. Some Cisco routers can be configured to run Multiple-HSRP. Using this removes the concept of primary and backup routers, and each will act as backup for the other, so you're totally protected.

Internally, your ISP will be running another horrible acronym called EIGRP (Enhanced Internet Gateway Routing Protocol), which allows it to assign different weightings to your two lines for both address blocks. Normally, the traffic will take the 'cheapest' route, but it will try the alternative if that isn't available. This exactly describes the setup the ISP provided for Paul's company. Obviously this still doesn't protect against total ISP failure, but one of the reasons Paul chose his ISP in the first place is that its network had been designed from day one to ensure that it won't suddenly go off air and, unlike many of its competitors, it never has.

Testing the new configuration was great fun. Switch off a router and everything is working again within a few seconds. Pull the plug on a leased line and, again, the little LEDs on the other router just start to flash more quickly. It's almost like magic, but not as magical as the reassuring feeling you get knowing that you won't get called out of bed at 3am because your monitoring service has lost sight of your servers. ☺

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is a consultant and programmer, specialising in Web development. He's never owned an anorak!

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# SEVENTH HEAVEN

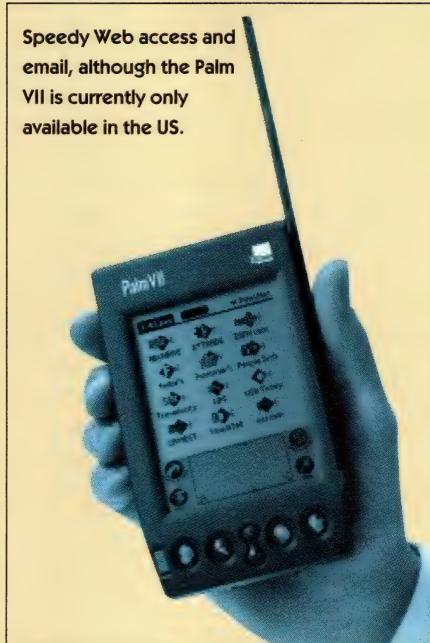
PAUL LYNCH REPORTS FROM THE PALM DEVELOPERS CONFERENCE, WHERE HE MAKES THE ACQUAINTANCE OF THE NEW WIRELESS PALM VII.

**L**ate last year I witnessed 3Com's unveiling of the Palm VII, a wireless communications version of the existing Palm III. Naturally, I grabbed the chance to talk to the developers of the product, and even gained some experience of using it too.

Wireless functionality is well integrated, so flipping up the Palm VII's aerial will switch the machine on in the same way as pressing the Memo button. Superficially, the software is almost identical to that on the Palm III, but with two additions: iMessenger, a simple email application, and the new Palm.Net tab in the Application launcher. This tab contains applications which offer a highly customised and targeted Web browser for each content provider's site, the intention being to speed up access to Web sites. The interface is driven by an HTML form which resides on the Palm, and it will connect to the Internet only to retrieve the requested data. Palm calls this process 'Web clipping', and while it doesn't constitute a general-purpose Web browsing facility, any competent Palm C++ programmer could write a standard browser in a couple of minutes using the APIs provided.

These Palm-resident applications are written using more or less standard HTML (with just a few custom tags), so with only minimal customisation Web sites can be fully optimised for display on a Palm VII; it should also be easy for new information providers to sign up with Palm. All wireless calls are routed through a Palm-operated special proxy server, which is responsible for content filtering. In

**Speedy Web access and email, although the Palm VII is currently only available in the US.**



practice, my tests revealed that network latency and loading means a response may come back in five seconds, or take ten to 20 seconds on a slightly more loaded network.

There's just one big catch with the Palm VII – it will only ever work in the US, because it's wholly dependent upon the American wireless networks. However, in theory, this software should be compatible with GSM links from an updated Palm III, and without all the extra wireless hardware – if, of course, Palm were ever to release it here. From Palm's point of view, in the absence of its special preconfigured installation for the BellSouth networks, a

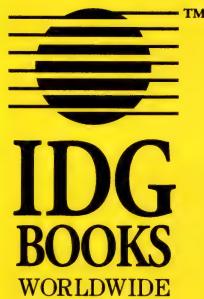
GSM version would require considerable communications skills on the part of the user.

Coming back to the Palm Developer Conference, Guy Kawasaki's presentation was met by a rather frosty reception when he said that email without a keyboard just wasn't an option. For your typical prolix, RSI-suffering, mailing-list-subscribing, high-volume email user, that may appear to be a self-evident truth, but I regularly use email applications on all my PDAs. Take my Newton 2100: I'd rather leave the add-on keyboard at home than increase the weight and volume of my baggage. And besides, when I send email from a handheld it's more of a Post-It note as I save the lengthy replies for when I'm back at home.

But thanks to this new Web clipping ability, from my seat in the conference hall in Santa Clara, I was able to check a detailed map of the *PC Authority* office location and pinpoint the closest cash machine to the office, so the content is already international, even if the data access provisions are not. To view the Palm VII as a purely US-centric Internet machine would be a mistake – this Palm offers far more potential.

## MP3 on CE

MP3 is the new, highly-compressed sound format for computers. Its main appeal is it can store one minute of CD-quality audio in just 1Mb, compared to 10Mb in native CD formats. To achieve this it uses lossy compression algorithms, which means the quality is audibly inferior to MiniDisc (which in turn is worse than CD), but it's still at least as good as a cheap radio or average car stereo. I



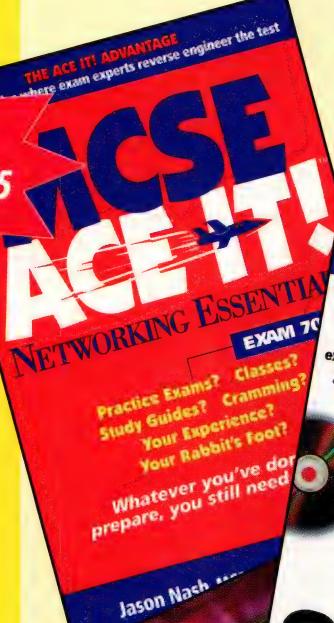
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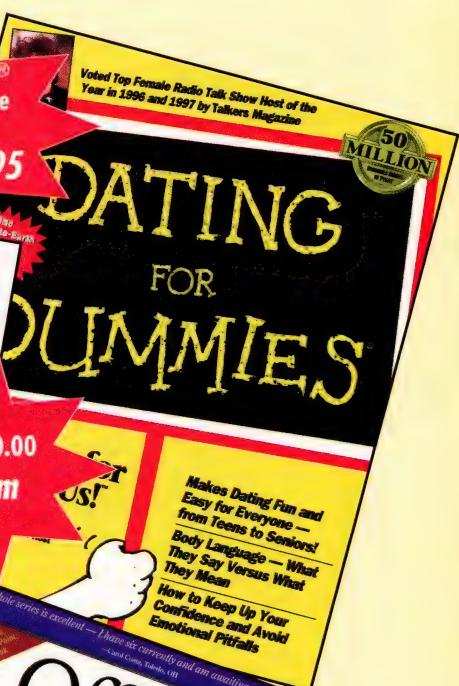
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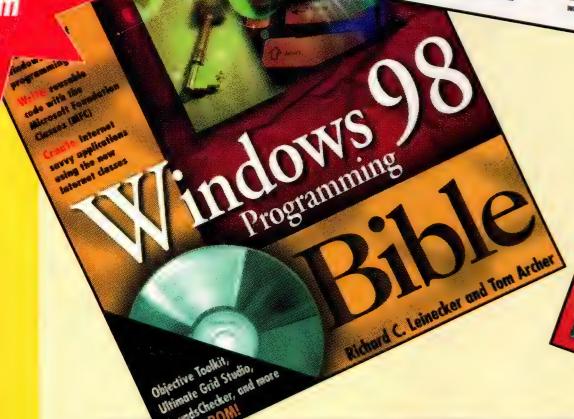
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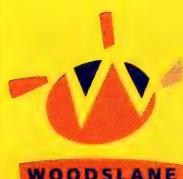
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# PDA hints and tips

## Infrared info

Until recently I've used both a Windows 95 laptop and a NT 4 desktop machine as my reference platform for PDA synchronisation, but I could never persuade either of them to work consistently using infrared to connect to any PDA – NT 4 doesn't support IrDA and Windows 95 requires some special patches. However, I've now added a small Windows 98 laptop, the Sharp Actius A-150, and infrared now works perfectly. I can now summarise the tips you'll need to get a Palm, CE or Psion S5 to work properly with infrared for synchronisation, file transfer and Internet communications.

## Windows 98

I didn't need to do anything, apart from install the synchronisation software and choose the serial port that talks to the IrDA port – COM4 in my case. Check that you have the right port by looking in the Control Panel for Infrared; it should be displayed in the Options panel.

## Mobile phone

Most major PDAs will support Internet connection over an infrared link to a mobile phone. I use a dual-band Ericsson SH888, but the Nokia 8810 will also work, and there is a clip-on module available for some Ericsson models to support infrared. With the SH888, the infrared port has to be specifically enabled from its main menu.

You'll also have to ask your phone service provider to enable data communications – and you might as well request fax to be enabled at the same time. Your service provider will give you two additional numbers, one for incoming fax and one for incoming data, but best of all this process also enables outgoing data calls.

## Palm III

Install the Palm IR enhancement patch, and either or both of IRLink and IRSync from IS/Complete. There are older patches that work,

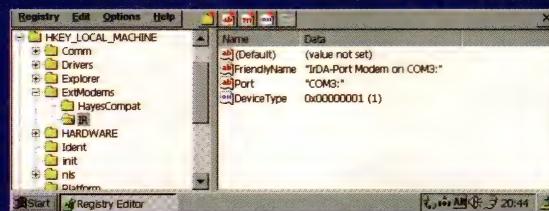
but these are the most comprehensive. The Palm patch adds a Prefs panel to toggle communication between using the serial port and IrDA; IRLink makes this switchover automatically; and IRSync requests synchronisation over the IrDA port.

• [www.palm.com/custsupp/downloads/irenhanc.htm](http://www.palm.com/custsupp/downloads/irenhanc.htm)

• [www.iscomplete.com](http://www.iscomplete.com)

## Windows CE

The latest version of CE Services 2.2 is required, which will work using a simulated serial port as well as IrDA, but on the CE device you should see a specific port to select under the PC Link menu option for Infrared – this will be preset to



Configuring CE for IrDA requires a Registry hack.

use 19,200bits/sec for reliability rather than the full 115.2kbits/sec that IrDA supports. Automatic connections only seem to work with a real serial port, not infrared.

Connection to the Internet, though, is not so easy. You can use the infrared port (it's even pre-installed as COM3 on the CE device), but the only way to install this is by using a Registry editor. For a palm-sized PC device, you'll have to use a desktop machine running Windows NT and the CE developer kit to edit the Registry.

• [www.microsoft.com/windowsce/pccompanions/wceserv.asp](http://www.microsoft.com/windowsce/pccompanions/wceserv.asp)

## Psion Series 5

Install the latest version of PsiWin (currently 2.2, but this is only available for extra cost), and the MessageSuite 1.52. Then, from the System application, set the Remote Link (<Ctrl-L>) to infrared, and in the Modems Control Panel, set up a new modem that uses infrared rather than serial, and set this to be your current modem.

• [www.psion.com/downloads/msgsuite.htm](http://www.psion.com/downloads/msgsuite.htm)

won't explore here the implications of MP3 for Web publishing of audio, or the traditional music publishing industry, but suffice to say it has already started a revolution in that industry.

The Diamond Rio (*reviewed issue 16, p97*) is an interesting PDA-sized, dedicated MP3 player with 32Mb of storage, which is enough to hold about 30 minutes of music at normal quality. It will be interesting to compare this device with the more generic playback systems

already available for some PDAs. For example, the XAudio Web site, which contains all kinds of drivers for MP3, has recently released a beta driver kit for Windows CE which provides a simple, no-frills playback program that allows you to select an MP3 file for playback. However, do bear in mind that it's only a beta release, so as yet it's not entirely glitch-free.

To create MP3 files, you'll need a player and encoder for your PC, both of which are

Diamond's portable MP3 player.

available from X-Audio; I used WPlay and BladeEncoder. Creating an MP3 file takes about twice as long as it does to play it back, as it requires one pass to grab the music into a (very large) WAV file, and a second to compress this to MP3 at your desired quality. However, transferring to a CE machine via an infrared link at 19,200bits/sec takes about ten minutes per minute of music!

As yet, these CE drivers only appear to be capable of playing mono files, and even when you have the right files, playback is dodgy and sounds choppy at best. The reproduction on my HP620 was very poor, and I couldn't get my Philips Nino to replay at all, although others have reported some success with it. Also, most CE machines neglect to include an earphone socket, my Everex Freestyle and LG Phenom being the only exceptions. Don't imagine these MP3 drivers will make a viable music machine out of your CE device – think of them instead as a technology demonstration and buy yourself a proper MP3 player.

• [www.diamondmm.com/rio/](http://www.diamondmm.com/rio/)

• [www.xaudio.com](http://www.xaudio.com)

## Palm case a clear winner

To finish on a really high note, all delegates at the Developers Conference received a free, transparent replacement case with a flip-up cover and battery compartment cover, albeit no stylus. The general reaction was one of excitement: the case reveals the memory card slot on the back of the Palm III which, unlike older models, is completely hidden by the normal case, so I took the opportunity to upgrade mine to the TRG 8Mb RAM SuperPilot card. This fits all old Pilot, PalmPilot and Palm III models and now ships with PalmOS 3 pre-installed in its 4Mb Flash RAM.

• [www.pilotgear.com](http://www.pilotgear.com)

• [www.trgnet.com](http://www.trgnet.com)

## Paul Lynch



Runs a company that provides services and software for NeXTStep, Apple's new OS, as well as intranets and ISDN.

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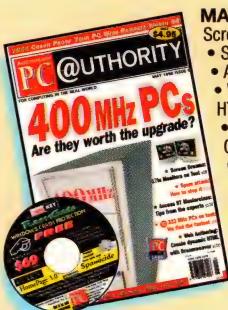
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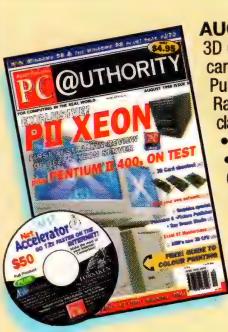


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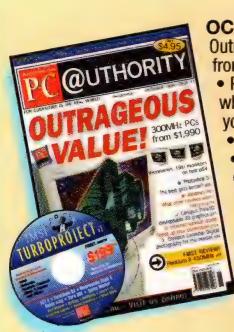


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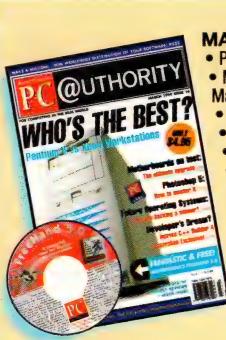


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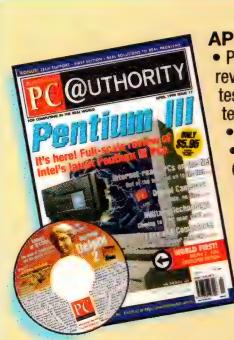


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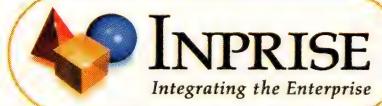
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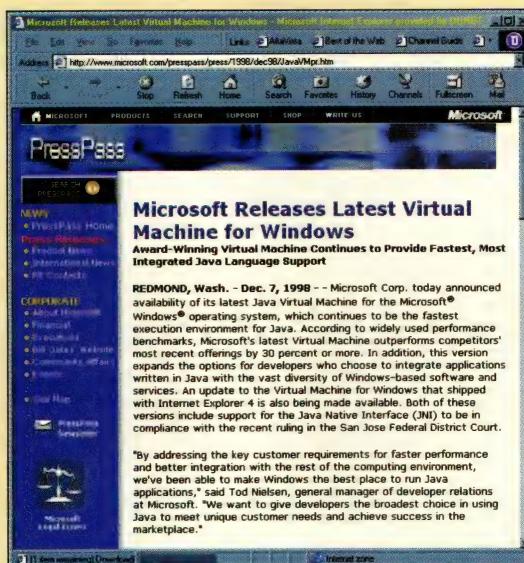
DAVE JEWELL LOOKS AT BUG FIXES AND CODE UPDATES, HIGHLIGHTS A NASTY CRITTER IN VB AND STARTS TO DEVELOP AN ACTIVEX COLOUR GRID CONTROL.

Explained last month how Microsoft has been forced to turn off by default certain non-standard Java extensions in its Visual J++ development system, and add in support for Sun's Java Native Interface (JNI) to its implementation of the Java Virtual Machine (VM). Although the court specified that this work should be carried out within 90 days, it seems the changes have been completed in double-quick time, as Microsoft actually announced availability on 7 December last year.

To download a copy of the revised VM, follow the links at [www.microsoft.com/java/whatnew.htm](http://www.microsoft.com/java/whatnew.htm). If you'd rather read up on what's involved, there's a related Microsoft press release at [www.microsoft.com/presspass/press/1998/dec98/JavaVM\\_pr.htm](http://www.microsoft.com/presspass/press/1998/dec98/JavaVM_pr.htm). Despite earlier claims that Microsoft didn't want to add JNI support to the VM because this would negatively impact the performance, you'll see that the press release doesn't hesitate to declare that this revised VM is still the fastest implementation around. Hmmm...

On the subject of code changes, Microsoft has also announced that it's identified some of minor Y2K incompatibility problems in Windows 98, but an OS update can apparently be downloaded from <http://windowsupdate.microsoft.com>; alternatively, you can call the Year 2000 hotline on 0870 333 2000 to get a free upgrade CD. Cynics might think this represents a golden opportunity for Microsoft to slip a few other much-needed Windows 98 bug fixes into the distribution channel, but I couldn't possibly comment.

Finally, a couple of months ago I mentioned



Microsoft has recently released the improved version of its Java Virtual Machine, which now incorporates Sun's JNI.

the corruption of image-lists in Delphi 4 when working with certain video cards such as the STB Velocity 128. You may recall that Inprise was apparently working on a solution, but it seems someone else has got there first. A 3KB Pascal file claiming to fix the problem was recently uploaded to Cix. Since this file originated on Usenet and appears to be a public-domain contribution, I've included it on this month's cover disc as ISIM.ZIP. Having binned my STB video card I haven't been able to test it, but I'd like to hear from STB/Delphi 4 developers as to whether it fixes the problem in any apps you create. What it can't do is fix the problem in the Delphi IDE's own image-lists.

## Use WITH care!

If you've done much programming in Visual Basic (VB) or Delphi Pascal, you'll know that both of these languages use the WITH statement, which is a sort of semantic shorthand that allows you to refer to record fields or object instance variables without specifying the full name of their parent object, the end result being more concise code. Here's a simple example I've taken from VB's on-line documentation:

```
With MyLabel
    .Height = 2000
    .Width = 2000
    .Caption = "This is MyLabel"
End With
```

In this code fragment, MyLabel is a text label control on your form: once the WITH statement has been executed, you can implicitly reference the control by just using a period to precede the next three assignment statements without spelling out MyLabel in full each time. Behind the scenes, Height is expanded to MyLabel.Height and so on, to give code that's a lot more compact. Pascal has a similar facility, but it doesn't require the preceding period to identify a reference to the currently active WITH statement (which means the compiler has to examine all active scopes to determine what's actually being referenced). You'll appreciate that, in Delphi, over-enthusiastic use of nested WITH statements can be prone to error and result in code that's difficult to understand.

Why am I mentioning all this? In a recent discussion on IRC, it turns out that VB's otherwise superior WITH statement is let down by a nasty bug which, in certain circumstances,

may cause you more than a little head-scratching. In Delphi Pascal, `WITH` is merely a semantic shorthand – that is, although the compiler may well store the ‘target’ location in a register or temporary variable to improve performance, the underlying *meaning* of the code remains the same. However in VB, when you use a `WITH` statement to refer to an object, the VB run-time library will actually take out a reference to this object, and lock it at the same time. Under normal circumstances, that object will be unlocked again when the corresponding `END WITH` statement is encountered, but if your code jumps out of the `WITH` clause using some variation on the `EXIT` statement, it’s possible to end up with the object still locked. I’m grateful to Trevor Prinn ([tprinn@cix.compulink.co.uk](mailto:tprinn@cix.compulink.co.uk)) for pointing this out; here’s a code fragment similar to the one he showed me:

```
For Index = 0 to Count
  With SomeObject
    —< some code >—
    If —< condition >— Then Exit
  For
    —< some more code >—
  End With
  Next Index
```

In this instance, you can see that the code may potentially jump out of the enclosing `FOR` loop if a certain condition is met. However, this will also involve jumping out of the `WITH` statement, leaving the object, `SomeObject`, still locked. In fairness, Microsoft does document this particular ‘feature’ of VB, although it takes pains not to classify it as a bug.

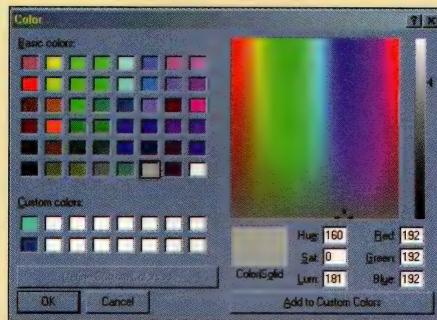
By contrast, consider the way the Delphi run-time code works. As I mentioned in my recent discussion on structured exception handling and try-finally blocks, if you use Delphi’s `EXIT` statement to escape from a protected code block, the finalisation code will *still* be executed – and that’s exactly how it should be. Whatever language construct has been used to establish the run-time state, such as `WITH`, try-finally and try-except, the compiler should generate code to undo that state as soon as the construct is terminated. In this respect, Microsoft should take a leaf out of Delphi’s book. In the meantime, if you routinely employ `WITH` statements in your VB programs, you should review their usage so as to ensure you don’t run into this problem.

### Colour picker control

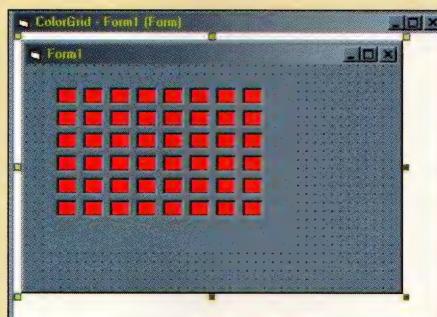
Some months ago I mentioned CCRP, the Common Controls Replacement Project. In case you missed it, suffice it to say that CCRP is a group of dedicated individuals who use VB to create OCX controls that are as good as (or generally better) than the controls supplied in Microsoft’s Common Controls library. When I first mentioned CCRP, I criticised its choice of VB as the primary development language,

saying that the controls would be more generally applicable (and much more lightweight to deploy) if they’d been created in, say, Visual C++ and the ATL (Active Template library). CCRP has recently responded to my comments and posted both sides of this debate on its Web site. To check it out, go to [www.mvps.org/ccrp/ccrpmain.htm](http://www.mvps.org/ccrp/ccrpmain.htm).

Since it’s some time since I covered ActiveX control development in VB, now seems like a good opportunity to plug one or two of the gaps in CCRP’s product line. Okay, having sounded off about VB not being the ideal tool



For the next two months I’ll be providing code for an ActiveX control that emulates the colour grids on Microsoft’s standard colour picker dialog.



Here’s the colour grid component in action – any colour so long as it’s red!

for this sort of work, I’m now creating a control in VB – but, then, one’s got to be pragmatic after all. If you’re already using VB for your main application development, the overhead involved in using a VB-authored OCX control is minimal; problems (concerning the VB run-time) only arise if you’re using Delphi or C++ for the main application.

As a first project, I’m going to recreate the colour grid that appears in Microsoft’s standard colour picker dialog. As you are no doubt aware, the colour picker dialog employs two grids: one to display a rather idiosyncratic selection of ‘standard’ colours, and the other to display those custom colours as defined by the user. Since a colour grid appears twice here, it’s logical to create a reusable colour grid control which encapsulates all the necessary appearance and behaviour, so that if you were to subsequently recreate the entire colour

picker dialog you could use the colour grid as a subcomponent within the dialog’s form. I’ve also added a number of custom properties which can be used to change the size and appearance of the colour grid – most importantly the number of rows and columns of displayed colour ‘cells’, and the size of each cell. This means you could, for example, incorporate this control into a non-modal toolbar as part of a drawing application, rather than thinking purely in terms of a modal colour picker dialog.

The source code is given in *Listing one*, but this is very much a work in progress and I’ll be adding more functionality next month. As you’ll see, a number of different properties are exposed by the control, all of which (this month, at least) are concerned with the control’s appearance. You can change the number of displayed rows and columns of colour cells through the `Rows` and `Columns` properties, and the pixel size of individual cells in the grid by using the `CellWidth` and `CellHeight` properties. Note the emphasis on *pixel* size: all my custom sizing properties are expressed in pixels, irrespective of what `ScaleMode` is in use by the container object. Personally, I find this a lot easier to work with than VB’s own baroque co-ordinate system; it will also make life a lot less confusing for those who try to use VB-authored components within other development environments and languages.

Another property I’ve implemented is `CellSpacing`, which gives the spacing (again in pixels) between adjacent cells in the grid. I’ve assumed that the same value should apply to both vertical and horizontal spacing, but it’s very easy to implement two distinct spacing properties if you prefer. The `CellSpacing` property is also used to provide a small horizontal and vertical offset from the top-left corner of the control. Finally, I’ve implemented a property called `CellStyle` which defines the way in which individual colour cells are drawn. Based on the `csCellStyle` enumeration type (again, see *Listing one*), it defaults to the value of `csSunken` which gives a recessed appearance to each cell. In fact, the default values of all the properties in the colour grid have been chosen to mimic the appearance of the standard colour grid in the Common Dialogs library. You can also specify that the colour cells should be raised above the underlying control surface, drawn with a little ‘bump’ around them or with an etched appearance.

Most of the code in *Listing one* simply retrieves and saves property values, but there are a couple of noteworthy routines. First is the `UserControl_Paint` routine which is responsible for actually painting the surface of the control: as you can see, it comprises two nested `FOR` loops which iterate through all

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# Code

### Listing one

```

Option Explicit
' Cell style enumeration
Public Enum csCellStyle
    csSunken
    csRaised
    csEtched
    csBump
End Enum
' Property values
Private m_Columns As Integer
Private m_Rows As Integer
Private m_CellWidth As Integer
Private m_CellHeight As Integer
Private m_CellSpacing As Integer
Private m_CellStyle As csCellStyle
' Default property values
Private Const Def_Rows = 6
Private Const Def_Columns = 8
Private Const Def_CellWidth = 20
Private Const Def_CellHeight = 16
Private Const Def_CellSpacing = 5
Private Const Def_CellStyle =
    csSunken
    Public Property Get CellStyle() As
    csCellStyle
        CellStyle = m_CellStyle
    End Property
    Public Property Let CellStyle(ByVal
    newValue As csCellStyle)
        m_CellStyle = newValue
        PropertyChanged "CellStyle"
        Refresh
    End Property
    Public Property Get Columns() As
    Integer
        Columns = m_Columns
    End Property
    Public Property Let Columns(ByVal
    newValue As Integer)
        m_Columns = newValue
        PropertyChanged "Columns"
        Refresh
    End Property
    Public Property Get BackColor() As
    OLE_COLOR
        BackColor = UserControl.BackColor
    End Property
    Public Property Let BackColor(ByVal
    newValue As OLE_COLOR)
        UserControl.BackColor = newValue
        PropertyChanged "BackColor"
        Refresh
    End Property
    Public Property Get Rows() As Integer
        Rows = m_Rows
    End Property
    Public Property Let Rows(ByVal
    newValue As Integer)
        m_Rows = newValue
        PropertyChanged "Rows"
        Refresh
    End Property

```

```

    End Property
    Public Property Get CellSpacing() As
    Integer
        CellSpacing = m_CellSpacing
    End Property
    Public Property Let
    CellSpacing(ByVal newValue As Integer)
        If newValue >= 0 Then
            m_CellSpacing = newValue
            PropertyChanged "CellSpacing"
            Refresh
        End Property
        Public Property Get CellHeight() As
        Integer
            CellHeight = m_CellHeight
        End Property
        Public Property Let CellHeight(ByVal
        newValue As Integer)
            If newValue >= 10 Then
                m_CellHeight = newValue
                PropertyChanged "CellHeight"
                Refresh
            End Property
            Public Property Get CellWidth() As
            Integer
                CellWidth = m_CellWidth
            End Property
            Public Property Let CellWidth(ByVal
            newValue As Integer)
                If newValue >= 10 Then
                    m_CellWidth = newValue
                    PropertyChanged "CellWidth"
                    Refresh
                End Property
                Private Sub DrawCell(X, Y As Integer,
                Color As Long)
                    Dim R As RECT
                    Dim Edge As Long
                    Dim Brush As Long
                    SetRect R, X, Y, X + m_CellWidth,
                    Y + m_CellHeight
                    Select Case m_CellStyle
                        Case csSunken: Edge =
                        Edge_Sunken
                        Case csRaised: Edge =
                        Edge_Raised
                        Case csEtched: Edge =
                        Edge_Etched
                        Case csBump: Edge =
                        Edge_Bump
                    End Select
                    DrawEdge hdc, R, Edge, BF_Adjust
                    Or BF_Rect
                    Brush = CreateSolidBrush(Color)
                    FillRect hdc, R, Brush
                    DeleteObject Brush
                End Sub
                Private Sub
                UserControl_InitProperties()
                    UserControl.BackColor =
                    Ambient.BackColor
                    m_CellHeight = Def_CellHeight
                    m_CellWidth = Def_CellWidth
                    m_Columns = Def_Columns
                    m_CellSpacing = Def_CellSpacing
                End Sub
            End Sub
        End Property
        Private Sub UserControl_Paint()
            Dim Row, Col As Integer
            For Row = 0 To m_Rows - 1
                For Col = 0 To m_Columns - 1
                    DrawCell m_CellSpacing +
                    (m_CellWidth + m_CellSpacing) * Col, -
                    (m_CellHeight + m_CellSpacing) * Row, -
                    &HFF
                Next
            Next
        End Sub
        Private Sub
        UserControl_ReadProperties(PropBag As
        PropertyBag)
            On Error Resume Next
            Columns =
            PropBag.ReadProperty("Columns",
            Def_Columns)
            Rows =
            PropBag.ReadProperty("Rows", Def_Rows)
            CellStyle =
            PropBag.ReadProperty("CellStyle",
            Def_CellStyle)
            CellHeight =
            PropBag.ReadProperty("CellHeight",
            Def_CellHeight)
            CellWidth =
            PropBag.ReadProperty("CellWidth",
            Def_CellWidth)
            CellSpacing =
            PropBag.ReadProperty("CellSpacing",
            Def_CellSpacing)
            UserControl.BackColor =
            PropBag.ReadProperty("BackColor",
            Ambient.BackColor)
        End Sub
        Private Sub
        UserControl_WriteProperties(PropBag As
        PropertyBag)
            PropBag.WriteProperty "Columns",
            m_Columns, Def_Columns
            PropBag.WriteProperty "Rows",
            m_Rows, Def_Rows
            PropBag.WriteProperty
            "CellStyle", m_CellStyle,
            Def_CellStyle
            PropBag.WriteProperty
            "CellHeight", m_CellHeight,
            Def_CellHeight
            PropBag.WriteProperty
            "CellWidth", m_CellWidth,
            Def_CellWidth
            PropBag.WriteProperty
            "CellSpacing", m_CellSpacing,
            Def_CellSpacing
            PropBag.WriteProperty
            "BackColor", UserControl.BackColor,
            Ambient.BackColor
        End Sub
    End Property

```

the colour cells, figuring out the location of each cell and calling the DrawCell routine to draw them. In this month's code you can have any colour – so long as it's red! The DrawCell routine takes a parameter which specifies the 'fill colour' of each cell, and for now I've just hard-wired this so that all cells are drawn with a red interior. Next month I'll add the functionality to set up an array of colour values for use by the individual cells.

However, where the rubber really hits the road is in the DrawCell routine that makes use of a very flexible API routine called DrawEdge, which draws the three-dimensional border around each cell. Due to

the way I've called this routine (by specifying the BF\_Adjust flag), the rectangle structure which is passed to DrawEdge will be automatically adjusted by the DrawEdge routine so that on its return it corresponds exactly with the interior dimensions of the colour cell. Thus, if the cell is drawn with a two-pixel border, DrawEdge will shrink the dimensions of the passed rectangle by two pixels in each direction so that it 'fits' the cell interior exactly, making it very convenient to subsequently call the FillRect API routine to draw the cell interior.

Next month I'll be adding more features to this control, such as the ability to respond to

mouse events, to highlight the currently selected cell and assign different colours to each cell. You'll find all the project files and source code on this month's cover disc. ☺

### Dave Jewell

 Freelance journalist, Windows consultant and programmer specialising in low-level system programming. Author of *Instant Delphi* (Wrox Press).

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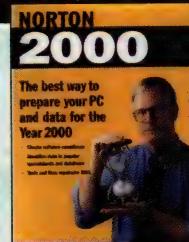
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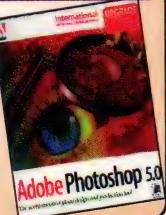


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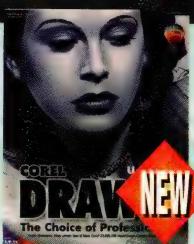
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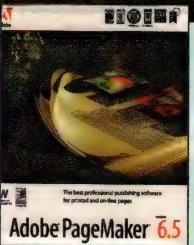
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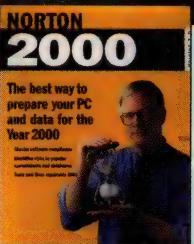
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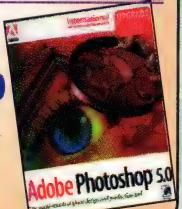
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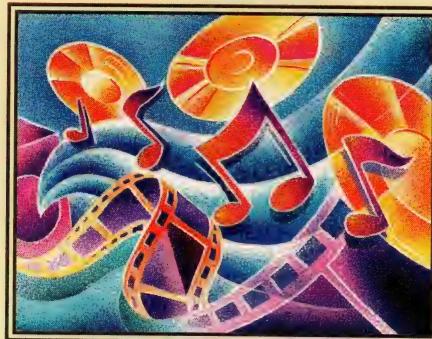


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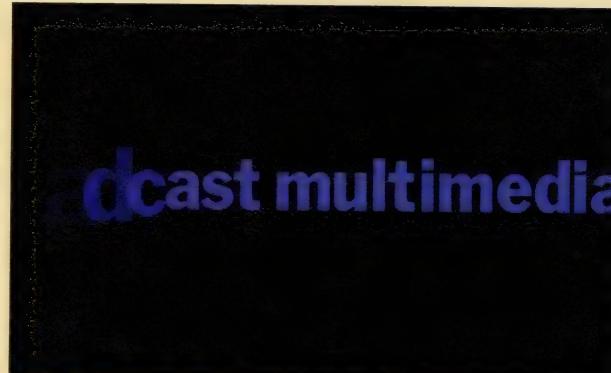
# UPGRADES GALORE

KEVIN PARTNER EXPLORES REVAMPED VERSIONS OF THE LEADING MULTIMEDIA AUTHORIZING TOOLS, AND REVISITS VISUAL BASIC.

You know how it is, you wait and wait for upgrades to your favourite authoring tools, and then half a dozen come along at once. And like buses, they all claim to make it both easier and quicker for you to get to your destination, in this case, whether you're using the CD-ROM motorway or the Information Super-towpath that is the World Wide Web. So how will the latest updates affect the relative strengths and weaknesses of the leading multimedia authoring tools?

The upgrade that will have the biggest impact, if only because of the sheer number of developers using the product, is version 7 of Macromedia Director. Indeed, so major is this upgrade that the product has even been lavished with a longer name – the Director 7 Shockwave Internet Studio. The name should tell you all you need to know about the direction in which the product is being pushed; in fact, it's a push that applies to the entire stable, since Director is the last major product to become a fully fledged Internet development tool.

There are two major changes in this latest version. The first is an improvement in the creation of leading-edge graphics and animations. When it was first released, Director's visual effects were its chief competitive advantage, but over the last couple of years Director has fallen behind the field, especially when authoring tools such as Scala MM200 and Dazzler Deluxe beat it to the post with DirectX



Broadcast multimedia comes to the Web with Scala iPlay.

and Alpha Blends. MM200 extended the boundaries of what can be achieved in terms of TV-like effects, and Director is only now catching up with alpha channels that allow more exact control of transparency and blending between objects. These changes mark Director's return as a viable choice for high-impact CD-ROM production (although I'm sure many people would say that this has always been the case anyway).

The second change and main thrust of the upgrade concerns Director's Internet facilities. In previous versions, you created content in Director and then converted it to Shockwave for delivery. While this worked fairly well, the new version now integrates Shockwave into the development interface; it also enables HTML text to be imported and edited within Director while still preserving links. As such, Director has taken the final step to becoming a true high-end Web generation tool. The rest of the Macromedia product line contributes to this new status by way of excellent integration with

Director – version 7 ships with Fireworks, Macromedia's innovative one-stop bitmap editor, which itself is tightly integrated with Dreamweaver 2, the latest version of the best Web page creator in the business.

This new version of Dreamweaver incorporates a host of additional features that will be indispensable to multimedia authors who are developing for the Web. Dreamweaver has always been my favourite for multimedia Web deployment because of its uncluttered, highly visual interface and its ability to generate HTML code without interfering with any hand-coded sequences. Version 2 concentrates on making the creation of interactive, animated Web pages even simpler and quicker than its predecessor. For example, this version includes a number of co-ordinated colour schemes and a quite brilliant tracing layer that helps you to match your page elements to a background graphic. Table manipulation is very much improved and now features several pre-formatted table types. Site management has also been enhanced with the addition of a far more intuitive visual site map and the ability to find and replace text across an entire site.

Dreamweaver 2 also includes the ability to create and save templates, so similar pages can be produced considerably quicker. In a nutshell, although I liked Dreamweaver 1.2, I love Dreamweaver 2. In fact, it's now my tool of choice for multimedia on the Web, not just on its own merits but also because of its integration with Director and Macromedia's suite of Web-related products.

# Putting the 'visual' in VB

Here are a couple of simple procedures that add a 'horizontal blinds' transition effect to a VB form. No add-ins or custom controls are required, and any version of VB from 4 onwards will suffice, be it Learning, Standard or Professional. Since you'll want these procedures to be available to any VB program you write, I've created a module called `reuse.bas` to contain code that is reusable, and whenever I create a new VB project, I import a copy of this module. For this project, you will need to create a global variable called 'Amount' (minus quotation marks), using the syntax 'Global Amount as Integer' in the Declarations section of `reuse.bas`.

First create a new form, which should be  $9,600 \times 7,200$  (that is,  $640 \times 480$  pixels) in size. It should have no caption, no control box or minimise or maximise icons, and the border should be 'single'. For best effect, add a large picture to this form's background.

The first piece of reusable code is the very simple 'Centreform' procedure which, as the

```
Sub CentreForm(f As Form)
    f.Move (Screen.Width - f.Width) / 2,
           (Screen.Height - f.Height)
    / 2
End Sub
```

This brief and very simple code segment causes the form calling it to be centred on screen.

name suggests, centres the form on the screen. (I know the maths isn't difficult but it's much simpler just to type 'CentreForm Me' than it is to remember the formula itself.) Having created this procedure, you then need to add the line `CentreForm` Me to the Form Load event. The result is that the form will be centred before it is displayed.

Two procedures are required actually to implement this transition: `BuildBlinds` sets up the transition by covering up the background with rectangles, and `Blinds` then removes the rectangles to reveal the form behind. When adding the blinds you have two choices – you can either cover the background with Shape objects or with Picture boxes. Shape objects are removed more quickly and impressively, but they cannot be placed on top of any pictures or controls on the form. Picture boxes can be placed on top of controls, but they are removed more slowly.

For this example I've chosen to use picture

```
Sub BuildBlinds(f As Form)
    With f.picture1(0)
        .Height = Amount * 15
        .Visible = True
    End With

    For n = 1 To 30
        Load f.picture1(n)
        With f.picture1(n)
            .Top =
                f.picture1(n - 1).Top +
                240
            .Height =
                Amount * 15
            .ZOrder 0
            .Visible = True
        End With
        Next n
```

This code creates the blinds, covering the screen in black picture boxes...

boxes for their added flexibility. Begin by adding a picture box with a flat

border and a black background colour to the top of the form – it needs to extend from top left to top right and to be around 20 pixels in depth. Add a zero to the picture box's Index property to make it the first control in a control array (VB allows you to create new controls dynamically, but it needs an original to copy). `BuildBlinds` creates enough copies of this picture box to cover the screen completely, each copy positioned below the previous one; and because it is called from the Form Load procedure, this all takes place before the form is visible, with the result that it first appears covered in black. The `Amount` variable specifies how tall (in pixels) each box should be: a value of around 20 will usually suffice, but you can try other values to vary the effect.

Finally, create a Timer object with a delay of

```
Sub Blinds(f As Form)
    Amount = 50

    For m = 240 To 0 Step -Amount
        For n = 0 To 30
            If f.picture1(n).Height > Amount Then
                f.picture1(n).Height =
                    f.picture1(n).Height - Amount
            Else
                f.picture1(n).Visible = False
            End If
        Next n
        Next m

    For n = 1 To 30
        Unload f.picture1(n)
    Next n
End Sub
```

...and this code causes the picture boxes to contract vertically, giving the blinds effect.

around 500 milliseconds, and in this timer's default event begin with 'timer1.enabled=False' to turn the timer off (otherwise it will continually remove the blinds). Now type 'Blinds me' (minus the quotes) to activate the

Blinds procedure. (You can't put Blinds me into the Form Load procedure because the transition would take place before the form appeared and it would then appear that

nothing had actually happened.)

Blinds removes the picture objects by reducing their heights more or less simultaneously. Amount is used in a different way here, to specify how much smaller the picture boxes should become after each step: a value of 45 means they become three pixels smaller. If you've used Shape objects rather than pictures you can use a much lower value.

Now run the program. What you should see is that the form goes black and then clears with a blinds transition. Creating other transitions is just as easy – I was able to add vertical blinds, curtains and venetian blinds in 30 minutes. These simple procedures will allow you to enhance multimedia programs written in Visual Basic with transitions which are just like those being offered by professional presentation tools.



This is how it looks in mid effect.

### ToolBook and Dazzler

Asymetrix's ToolBook II series has also been recently upgraded (I mentioned the upgrade to Assistant 6.5 in my last column), and now it's Instructor's turn to move up to version 6.5. As with Director, the main enhancements are aimed at bolstering Instructor's credentials as a Web delivery tool. Version 6.5 includes much-improved HTML export facilities (particularly to version 4 browsers) with object overlapping and cascading style sheets, so your exported Web presentation will now bear a much closer resemblance to the original. However, there are times when HTML simply doesn't offer the facilities demanded by interactive multimedia. ToolBook remedies this with its own Shockwave equivalent which goes by the name of Neuron. While Neuron itself hasn't seen any significant changes, Instructor now ships with the Impulse utility which can reduce file sizes by up to 80 per cent to give much shorter download times. However, the Neuron plug-in isn't nearly as widely used as Shockwave (which is included with Windows 98), and it's much larger too.

You can now incorporate RealMedia into your ToolBook presentations. This offers obvious advantages for Web delivery, and it's finally possible to include interactive video clips in Web-based courseware. The other enhancements are fairly minor: for example, you can now synchronise the position of a video clip according to the text a user clicks. For instance, if you created a clip of Stonehenge changing over the ages, together with a list of corresponding dates underneath it, the clip could position itself to the date clicked by the user.

Dazzler Deluxe has received a rather more substantial makeover, although the changes are aimed at improving the design environment rather than bringing in new features. A project view and the ability to preview objects without having to switch to the presentation window, both help to simplify the creation of complex courses and render them less error-prone. The ability to alter the properties of all objects associated with a 'style' eliminates one of Dazzler's biggest weaknesses – if your client doesn't like the colour of your push-buttons, you can now make a single amendment to the style so any similar push-buttons change too.

Again, a number of the changes are designed to focus attention on Dazzler's Internet credentials. Unlike Director and ToolBook, Dazzler doesn't use a plug-in but instead converts the whole presentation into Java, which has the benefit of offering a much smaller download. And it works very well, too. However, the Java converter doesn't support certain Dazzler actions; in my view, Intelmedia should really create a browser

plug-in so that developers would at least have a choice.

To my mind, the most useful improvements concern the course packager. The facility to develop courses under Windows 3.1 has been reinstated (by popular request, I suspect), and although you lose some of the features of the 32-bit version, 16-bit platforms still make up a large proportion of our client base and it's good to be able to use most of the features of version 5, rather than having to fall back on an older version of Dazzler for 16-bit development. You can also now package a course so that it runs entirely from CD-ROM with no installation on the target machine whatsoever. This feature opens the door to workstation and closed-system delivery – a boon for developers working with high-security intranets. It also means that your showreel or electronic brochure can be viewed by clients without them having to go through a tedious install-and-uninstall. This might seem like a minor point, but being able to add 'Requires no installation, just pop in and view' to your CD-ROM means your demo is that little bit more likely to be viewed than that of your competitor.

Another of my favourite tools, Illuminatus, is undergoing an upgrade to version 4.5. The main changes here appear to be the addition of wizards to simplify the process of distributing publications and creating questions. If you're interested in seeing what Illuminatus can do, check out the Digital Workshop Web site ([www.digitalworkshop.co.uk](http://www.digitalworkshop.co.uk)) since it includes a number of tutorials for Paint Shop Pro 5, all of which were created using this very package.

By the time you read this, version 5 of Mediator Pro will also have been launched, bristling with greatly improved visual effects and an all-new user interface. More on that as I get it...

And finally, Scala MM200, long overdue for an upgrade, has now sprouted Internet capabilities of a sort thanks to the advent of the iPlay Studio and Viewer. The Viewer is essentially an Internet version of the Scala player, but it differs from most in that it works in a window of its own, independently of a browser. It's also much bigger than most plug-ins, weighing in at a hefty 3.91 Mb. iPlay Studio and Viewer are currently undergoing public testing and I'll let you know how they get on.

### Good ol' VB

Progress is generally a good thing, but in the world of computers, progress, almost by definition, means that a large number of potential users will be using hardware and software which is several years behind the leading edge. It's for this very reason that I still regularly use Visual Basic version 4,

which is now two versions out of date. Using VB 4, I can create 16-bit code, which can be used by clients with Windows 3.1 just as effectively as those with Windows 95/98. (The truth is, it's only the newer version's improved coding facilities that have managed to wean me off VB 3.)

But VB isn't an authoring tool. Or is it? Well, in one sense it's simply a step on from ToolBook, which incorporates a VB-like coding language behind its visual interface. For me, VB is an insurance policy, a last resort. When I first receive a brief, I immediately think, can I do it in Mediator or Illuminatus? If I can't, then the next most productive authoring tools would be MM200 and Dazzler, followed by Director and then ToolBook. It's only if none of these will do for the task that I consider VB.

Here's an example. Say I want to create an on-screen board game similar in feel to Monopoly (though not to a legally actionable degree!) as an unusual and innovative multimedia test. Unless I was willing to limit severely the game's features and flexibility, this would be too ambitious to tackle in Mediator, Illuminatus, MM200 or Dazzler. I could use Director or ToolBook, but one of my rules of thumb suggests VB. The rule is this: if I expect to spend more time writing code than laying out screens, I'll use a tool specifically designed around coding – VB.

Okay, so VB is the 'sensible' choice, but unless you want to invest in specialist add-ons, it's a bit light on special effects. For example, adding a 'blinds' transition to a Director or Mediator presentation is trivially simple, but it's impossible to achieve in VB. Or is it? In actual fact, this isn't as difficult as it sounds, and once you've created a library containing the code you can reuse it as and when necessary. This month's listing box shows you exactly how to do it. I'll confess that I had a bit of a 'Eureka' moment when I discovered these admittedly quite simple procedures, as I'd always just accepted that fancy transitions are beyond the realm of VB. I was wrong. ☺

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## Make the right choice

*The five main things to look at when choosing an Internet Service Provider are location, network equipment, connections, download performance and cost.*

### Location

An ISP needs to have a point of presence (POP) in your area so you don't have to pay any STD charges. Freeserve has National POP coverage. In fact, 85 per cent of the Australian population should be able to access us with the cost of a local call. Freeserve offers Points of Presence in Melbourne, Sydney, Canberra, Adelaide, Hobart, Brisbane and Perth as well as many regional areas so your account is only a local phone call away (plus your online time).

### Network equipment

A recent article in Network Magazine ([www.network-mag.com](http://www.network-mag.com)) notes that the most important criteria should be the ISP's network infrastructure. If an ISP has chosen to build its network using a single-vendor strategy, it gains improved interoperability and security, enhanced network availability and reliability, ease of introducing new services and technologies, and a lower cost of ownership and operation.

Freeserve operates a Cisco Powered Network service that helps deliver high-quality service while keeping costs – and thus customers' prices – competitively low.

### Connections

It's important that the ISP you choose has enough modems to handle all incoming calls. If you regularly get 'busy' signals when you attempt to connect to your provider it's not only frustrating, it's expensive. Aim for a ratio of no more than ten users to one modem. Any more users per modem and you're likely to encounter connection problems.

Freeserve has a ratio of no more than ten users per modem. You should never experience an engaged tone.

### Download performance

The links your ISP has to the Internet and modem connection rates affect the performance you get. Freeserve has one of the broadest bandwidth connections to the Internet in the country assuring excellent connection speeds. What that means in real terms is that you will be able to access the information you want at top speed. Banks of modems enable Freeserve to operate at your modem's optimum speed to serve the information you request at the fastest possible speed. 56K-modem access is available in Melbourne, Sydney, Adelaide, Canberra, Brisbane and Perth.



# freeserve

## Reap the rewards

*When you are on the net, time is money, beware cheaper ISP's with slower connection rates.*

### Cost

A cheap ISP may not give you good performance, and vice versa. When you compare cost to performance, you may be better off selecting a slightly more pricey ISP if it means you won't have to spend as much time on the Internet. There is usually a wide variety of price options. With a minimum monthly charge of \$20, Freeserve has a very simple and very competitive pricing policy of only 2.5c per minute.

Setting up your first connection to an ISP can be pretty daunting. To make this process a little less confusing, Freeserve gives you an easy to use Internet Starter Kit. Including Netscape Communicator, it provides all the tools you need to use email, Web and news services straight away.

Freeserve includes generous space for you to create your own personal home page and Netscape Communicator provides the software to get you started.

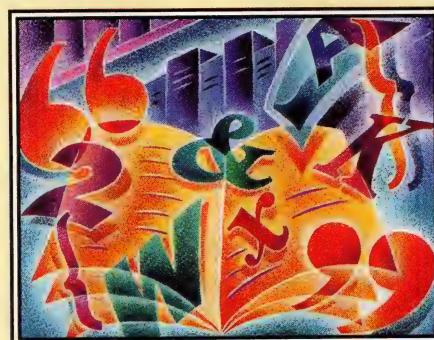
To give you more control over your account, the Freeserve Online Account Management Tools help you track your monthly usage, change your own password and much more.

### The faster the better

When it comes to the Internet, time is money. The longer it takes to download a file or Web page, the longer you need to stay connected to your ISP. And as most ISP's charge hourly rates, the extra cost can add up. So, you want the fastest connection you can get. Faster network, less waiting... with Freeserve. Independent surveys consistently rank the network Freeserve uses as one of Australia's fastest which means less waiting and better value for your online time.

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*The homepage will walk you through creating a new account in straightforward steps.*



# LIFE THROUGH A LENS

HAVING PREVIOUSLY CAST A VERY SCEPTICAL EYE OVER DIGITAL CAMERAS, TOM ARAH FINDS THAT HE NOW VIEWS THEM IN AN ENTIRELY NEW LIGHT.

**M**y first experience of digital cameras almost put me off them for life. With a fixed lens, poor focusing, dodgy colour and limited memory, those first efforts didn't even offer the basic functionality of a disposable point-and-shoot camera. Of course, their failings were supposed to be redeemed by the convenience of the all-digital medium but, given the time taken for the camera to charge up, the wait while it wrote each image to disk and then the age it took to download the images to the computer, convenience was hardly the first word that came to mind.

A more fundamental problem was the appalling image quality. The maximum resolution of  $640 \times 480$  (a grand total of just 307,200 pixels) meant printed output was severely pixellated. This should have been enough to kill the medium stone dead, and the only reason it didn't seem to be that the on-screen quality was so poor that the last thing anyone ever wanted was a printout.

The attempt to build an industry around a product that aspired to the functionality of a screen-only Polaroid (but without the quality, convenience or value) was frankly puzzling, given that a far superior technology was already in place. The unbeatable reproduction offered by the professional 35mm print (usually equated to a resolution of around 15 million pixels) and a century's worth of development of advanced features, such as zoom lenses and auto-focusing, made the traditional film camera's quality and



Nikon, one of the old-school establishment.

functionality the benchmarks to aim for.

Back then, it was difficult to see what benefits reinventing the camera in an all-digital format would offer. Certainly the potential for immediate computer access to images was attractive, but in that case the development effort should logically have gone towards digitising high-quality, film-based images. I therefore expected the death-knell for digital cameras to be sounded by a boom in dedicated film scanners or the arrival of one-hour PhotoCD processing shops. In fact, I thought digital cameras would be subsumed into another product entirely – the digital video camera. After all, the basic  $640 \times 480$  VGA resolution is actually very close to the TV screen standard, so a digital video camera can offer reasonable quality stills for on-screen use, together with the extra, unbeatable benefits of recording and editing sound and moving action without any quality degradation.

Of course, I've been proved completely wrong. Although the price of digital video cameras is now beginning to enter the sub-\$1,500 consumer level, the refusal of PC manufacturers to allow Intel to include

Firewire support directly onto motherboards has temporarily restricted digital video to professional users and dedicated hobbyists. In the meantime, the digital still camera manufacturers have grabbed the opportunity to produce second-generation products.

These latest cameras boast a typical megapixel resolution of  $1,280 \times 960$  and above – more than four times that of their predecessors, and which leaves the video camera lagging. Crucially, working on the basis of 200dpi for high-quality output, these cameras are capable of producing unpixellated images over  $6 \times 4$ in in size. In other words, megapixel cameras are approaching the sort of print quality associated with film photography.

This move up to megapixel resolution is an important step, and it's no longer just estate agents with Web sites who are being enticed, but average users too. As such, I decided I should also take the digital plunge. I checked all the relevant Web sites first, which proved an eye-opening experience. One Casio model I had once used, for example, put in an embarrassing performance with a basic  $640 \times 480$  resolution, a fixed lens and a fixed 4Mb memory card. However, the Casio Web site was touting the latest QV-7000SX model featuring megapixel resolution, 2x zoom, 8Mb of removable memory and a host of advanced features such as Web-browsable access, all for around the same price.

I was sorely tempted but, while other features are welcome in a camera, picture quality is non-negotiable. What I really wanted was a way of comparing the image quality of

different cameras, and [www.imaging-resource.com](http://www.imaging-resource.com) successfully met my every need. As well as the latest news and in-depth practical reviews, it offers downloadable image samples of the same indoor and outdoor scenes taken with every digital camera released. For those with leased line Web access (or considerable patience), it even offers the Comparometer which enables you to compare the same picture taken with different cameras side by side.

### Cool pix indeed

A little bit more investigation revealed that digital camera image quality has improved beyond all recognition. Also, the manufacturers leading the way in quality terms are the traditional camera makers Olympus, Fuji and

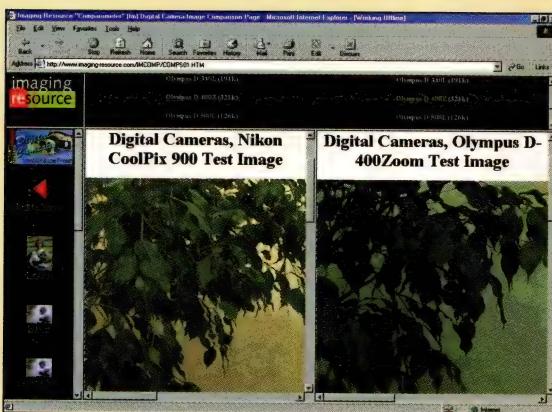
film speed of only 64. And, indeed, the camera clearly shows a tendency to long exposures, often up to the maximum length of a quarter of a second in dim conditions. Hand-shake is almost inevitable at such exposures so, unless you use a tripod and your object is static, you'd better resign yourself to blurred images.

The second problem arises from the JPEG compression used to store images on the card. The Nikon offers three compression modes equating to different JPEG quality settings. The default Normal setting produces images of around 250Kb each, and this is roughly half the size of the Fine and twice the size of the Basic settings. These defaults make sense in that there are fewer visible artifacts in Normal mode than in Basic mode, and they're hardly

any worse at Fine. Even so, the presence of any artefacts at all is clearly less than desirable. Saving to a format such as PNG that had no degradation would immediately solve this problem. Although this would mean only four images would fit on each 8Mb card, with 48Mb and larger cards now appearing this would hardly be a problem. Regardless, a Perfect option for high-quality studio work would be desirable right now. In addition, when using the JPEG format for default storage, an option to automatically convert to TIFF or PNG while transferring

the images would at least help to prevent further loss of detail when editing and resaving.

Despite these gripes, the on-screen image



The Comparometer at [www.imaging-resource.com](http://www.imaging-resource.com) allows you to compare the same images taken with different cameras.

Nikon. I was most impressed by the images produced by the Nikon Coolpix 900 and, with the recent release of the 900s, a minor upgrade offering more base memory, the option for external flash and a price around the \$2,000 mark, I was finally tempted to take the plunge.

My impressions on picture quality were equally positive. Although digital cameras and scanners are both based on a central CCD chip, they produce their images under very different conditions. It's the knowledge that the traditional camera manufacturers have gained over the last 50 years in terms of controlling aperture, exposure and focus that makes their cameras stand out from the crowd. The Nikon 900 in particular benefits from its unique nine-element Nikkor lens, a matrix metering mode based on 64 segments for determining exposure and the ability to discriminate between 945 separate focus steps.

The result is that the Coolpix's images tend to be very sharp and clear in both foreground and background, much more so than with my Olympus 35mm, for example. After longer use, however, some quality niggles have cropped up. The first concerns the length of exposures. Although the camera is claimed to pick up low-light levels down to EV4.5, Nikon still rates the Coolpix as equivalent to an ISO

quality is generally striking. It's equally impressive when output onto glossy photographic paper from a printer like the Epson 700 or Photo Ex, even though the 1,280 x 960 pixel limit results in slightly soft images when they're blown up to A4 size. In fact, the Nikon has convinced me that digital imaging can offer an increase in image quality over film.

This is partly due to the direct, first-generation nature of digital images: they capture light levels directly, bypassing both the



The Coolpix 900's slow film equivalence rating of ISO 64 can lead to blurring of moving images.

restricted colour gamut of traditional film and the inaccuracies introduced by scanning, to provide greater range, accuracy and sharpness. Just as importantly, the image's digital nature enables near-instant colour correction on a computer. And of course you have the ultimate quality control – by viewing the image you have just taken on the built-in LCD, you can reshoot it immediately if it isn't up to scratch. This is obviously one of the main selling points of all recent digital cameras.

Eventually though, the images have to be transferred to a computer for storage, editing and output. Amazingly, like most current-generation digital cameras, the Nikon doesn't offer USB, SCSI or infrared capabilities but relies on a completely inadequate RS-232 serial connection. As each preview thumbnail takes around four seconds to download, it takes well over two minutes for the 30 images on an 8Mb card to appear. Then, copying each file takes over 20 seconds, so you end up spending around quarter of an hour twiddling your thumbs. When 48Mb cards become more prevalent, both camera and PC will be tied up for over an hour.

Consider too the drain on camera battery life (which is poor enough anyway), the time and expense of producing prints and the need to have access to your PC every time you want to clear your card, and the claimed convenience benefit of digital cameras is still debatable. In the end, I was won over by a PC Card FlashCard adaptor that lets you plug the card into the PC Card slot on your portable PC. This effectively converts the memory card

into a hard disk, only much faster. The result is virtually instant thumbnail previews and the ability to archive a full set of images and clear the card in under a minute with no camera battery drain. Even better, the Nikon can upload images onto the card, which allows you to prepare presentations for TV playback. If you have a laptop or notebook, this adaptor is well worth it, as it finally delivers the speed and convenience that digital cameras have always claimed.



The Nikon's focus and sharpness is extremely impressive.

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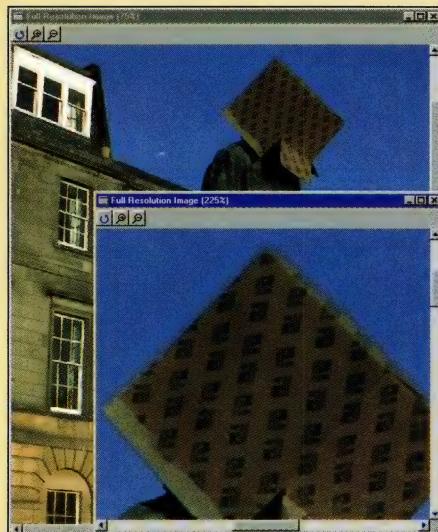


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Zooming in on an image reveals the artefacts created by JPEG compression.

### Panoramic potential

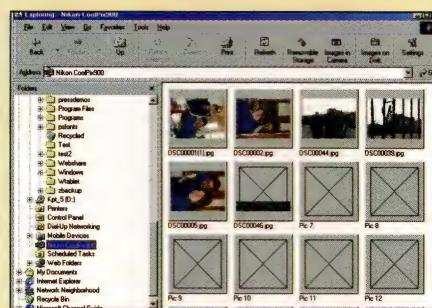
The final factor that has previously held digital cameras back has been their poor photographic capabilities. In particular, I was always horrified at the idea of spending more than \$800 on a camera that didn't even offer zoom – in the digital world where every pixel is precious, a zoom should be an absolute prerequisite. The Nikon Coolpix offers a decent 38-115mm, 3x optical zoom as well as one of the increasingly common 2x digital zooms. These enable magnification of up to 6x when you use them in combination. However, don't be fooled: the digital zoom simply blows up the central area of the image and interpolates all the extra pixels, which immediately softens the image. I'd have preferred the central image simply to be saved as a 640 x 480 VGA shot, which would save card space and allow the user to control enlargement themselves.

Having said that, the digital zoom option is useful for the crucial job of accurate image framing. Framing with the digital zoom is only possible using the LCD viewfinder, but it's usually much easier to use the optical viewfinder in other instances, especially in dim light conditions. Sadly, this is an area in which the Coolpix 900 seriously lets itself down. Bizarrely, the optical viewfinder only shows around 80 per cent of the final image. This is irritating enough in compositional terms, but it's also a criminal waste of digital image real estate. By reducing the useful resolution to nearer 1,024 x 768 pixels, this wasteful viewfinder should really be enough to demote the Coolpix from true megapixel status.

Apart from its zooms, the Coolpix also offers a number of advanced photographic features that simply don't make sense given the poor image quality of older digital cameras. In particular, it offers a manual mode in which you can change parameters such as the exposure in

0.5EV units, swap between three metering and five white balance modes, produce greyscale images and so on. In fact, the results in Automatic mode were so impressive that I found little need to turn to Manual mode. This is especially true as many of these on-camera features (such as the Greyscale mode and brightness and contrast controls) can't compete with the functionality available on your computer with a program like Photoshop.

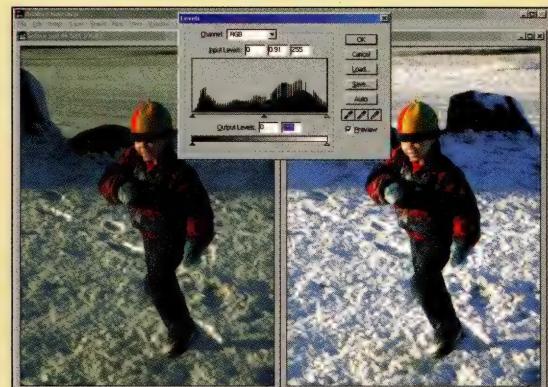
However, there's one manual setting, Continuous mode, that promises a lot for the future. There are three mode options: the default Single image mode, plus Continuous and VGA. Both of the additional modes work by switching off the flash, locking exposure and focus when you first press the shutter and then writing images as fast as possible to disk, like a rather slow movie camera. The full megapixel resolution of Continuous mode takes around two seconds to write each image, while in



Serial downloads are slow, but with a card adaptor they are nearly instantaneous.

VGA mode this drops to around half a second for a burst of up to ten images.

These two modes prove useful for very different projects. The exposure and focus lock and two-second interval of Continuous mode comes into its own for the creation of panoramas, especially when you use the 270-degree rotatable lens unit (although the Casio QV-7000SX has features, such as the edge of the previous image appearing in the viewfinder and automatic on-board image stitching, which are more useful still). Continuous VGA mode, on the other hand, is useful for catching action sequences, except that one image every half-second isn't quite quick enough to give a realistic idea of movement. Dropping image size to 320 x 240 or 160 x 120 would have made it possible to save eight or more images a second, again a feature offered by the Casio. These missed opportunities highlight the way that Nikon's film-based background is a weakness as well as a strength, but the potential they show for the future is ample compensation. In particular,



Despite its Manual mode, it's generally easier to control factors like white balance on the computer.

these panorama and action sequence capabilities reveal the way in which digital cameras are moving. As I originally believed, perhaps the divisions between digital cameras, high-resolution film-based cameras and low-resolution video cameras will eventually melt away after all.

Moreover, as the size of CCDs, speed of data handling and size of memory buffers increase, the digital camera's capabilities will move into completely new territory. One feature that is already boasted by the Casio QV-7000SX, for example, is potentially revolutionary if you scale it up to larger resolutions. The Casio allows you to save a series of images before fully clicking the shutter by automatically storing data in Movie mode whenever you half depress the shutter. You can then review these images, which means you'll effectively be able to recapture that 'picture that got away'. With no more shut eyes or lost smiles, a third-generation digital camera will finally enable you to take precisely the picture you want, whether high-quality, moving or even in the past.

This enticing prospect has certainly won me round to the potential of digital photography. Some areas still need improvement: battery life is poor, printed output is restricted by image resolution, JPEG compression is intrinsically low-quality, you have to lug your notebook on holiday, and so on. While I'm not ready to throw away my film camera just yet, I can't see myself ever buying a new one. ☺

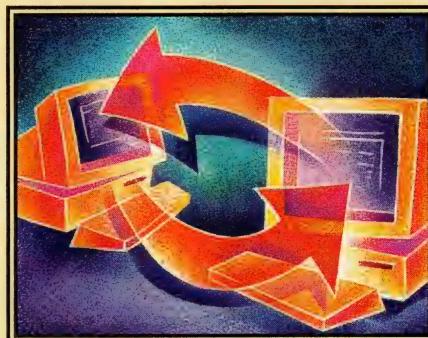
### Tom Arah



As well as writing for PC @uthority, Tom Arah runs a design, training and consultancy company.

### Contact

Email [pc@uthority.ajb.com.au](mailto:pc@uthority.ajb.com.au)

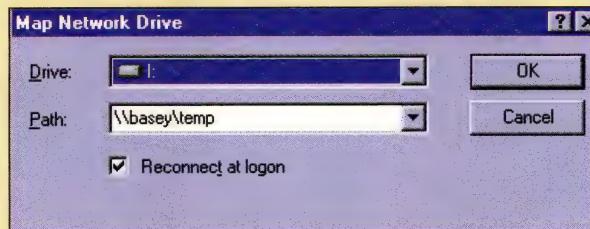


# IN THE WINFRAME

STEVE CASSIDY DISCOVERS A WINFRAME ODDITY THAT THROWS SOME LIGHT ON A VERY COMMON NETWORKING PROBLEM.

**R**egular readers of this column may have noticed that I'm in the habit of fiddling about with Citrix WinFrame. However, while I'm beavering away doing this, about 40 per cent of the queries that reach my mailbox invariably ask, 'Why don't my two Windows 95/98 machines network together properly?' Well, this month my endeavours and my mailbox collided when I came across a couple of interesting problems concerning a WinFrame environment that actually shed some illumination on the problems 40 per cent of you are experiencing with your two-machine networks. And blow me down, it's all to do with Microsoft's networking technology.

The problem arose among a small network of just ten users, whose need for WinFrame was based on their dependence on a somewhat ageing piece of software. The developers of this program won't be porting it from its underlying platform anytime soon, and that platform is resolutely multisite-hostile, hence the WinFrame solution. The problem these people were facing was that every so often, perfectly legitimate WinFrame users would be told that the WinFrame server had no more licences with which to make a connection. Then, a few minutes later, their sessions would connect without a hitch. It never affected the same users or the same PCs but, just as they embarked on some serious work so their connections would be refused. A peek at the licence manager in WinFrame showed 15 licences, but the problem was taking hold after



Microsoft's Browser technology makes other computers visible but is hidden from users.

only the fourth or fifth connection.

A trawling session through Citrix's Web site Knowledge Base uncovered no direct references to the problem, but it did highlight several indirect possibilities, most of which concerned bug fixes contained in the upgrade from WinFrame 1.6 to 1.7. People deploy WinFrame for many different reasons, be it to run old, network-unfriendly apps (as illustrated here), to boost speed in underpowered workstations or to provide dial-in support. Unfortunately, all of the material on Citrix's Web site is described in that turgid doublespeak favoured by the very largest IT departments – the fact that WinFrame might be of use to the little guys seems to have entirely escaped Citrix, and this is evident not only in the vocabulary used in its documentation (and Web site), but also in the software features it has been lavishing on the product itself. In this particular instance, the feature that catches out the small guys is load balancing.

Load balancing is the solution to a problem experienced by very big companies. No single PC server is yet large enough to accommodate all the processing needs of a company with a headcount of several hundred people. It may be

feasible to subdivide the processing among smaller departments, but this merely moves the problem a bit further up the market – it doesn't make it go away. In fact, even smaller departments can find themselves put in a tricky situation because loads can vary enormously between one hour and the next. But adding load balancing is a great solution: whenever someone wants to use the central

computer, send them off to the most lightly loaded departmental machine, do this using some smart load-measuring maths, and make the whole process invisible to the end user.

This sounds marvellous, until you come up against a design obstacle which points implacably in the opposite direction – namely, licensing policy. It's plain for everyone to see that a day will come when the programs on your PC won't run until they've talked to home base to see that you're a fully paid-up user (and checked exactly what it is that you have paid up to use). WinFrame has built-in smarts to balance your load across a group of machines, but to Citrix it's just as important to work out which, according to the legal constraints of your payments to the dealership, of three or four giant central servers you are allowed to use as it is to actually process your job. The most visible signs of this state of affairs are the extra layers of licensing and authorisation which encourage you to get onto the Web and register – a process which is even more complex than you might expect. Each separate installation of WinFrame onto a server produces a unique registration key: when you tell Citrix this key, it will send you



Dear Mrs. Johnson,

It is with my deepest sympathy that I write this letter to inform you that your son, Joe, was mostly melted yesterday in a skirmish with a unit of Tan soldiers.

What is left of Joe I've enclosed in this little baggie. I thought you might like to keep it. If anything else turns up, we will forward it immediately.

You should be proud to know that Joe fought bravely till the very end. As a keepsake, I've attached a photo of Joe in action.

Most people think it's some kind of game out here. For us, every day is a battle for survival. Joe understands that now.

With you in your time of sorrow,

Sarge  
Sarge



PC  
CD-ROM



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back the unlock code for *that* installation on *that* server. If you install from your copy of WinFrame more than three times, you must confirm this to Citrix in writing together with the reasons why – a situation that I arrived at myself having stripped and reloaded both my Dell and my ALR servers on more than one occasion.

But that's just the server licensing – user-count licensing also gets chucked into the load-balancing pool. When you install a WinFrame machine, this pool is where all your licences go by default, even if you only have one machine. Although one might assume that this wouldn't matter one jot, unfortunately it does. The use of licences in a load-balanced WinFrame setup is arbitrated by the Windows NT Browser.

### The Browser did it

This is where those two-user network queries in my mailbox come into play. Nearly all of the problems you guys pass my way involve clicking on Network Neighborhood, but without being able to see the other machine at the other end of your wire. 'How much simpler can a network be?' you all ask, 'So where on earth could I have gone wrong?' The answer is that you haven't discovered the Browser.

This process has been around ever since Windows for Workgroups first appeared, and it hasn't been altered in any material fashion since – or at least, so far as the bit we're looking at is concerned. The Browser sits a little higher up the network hierarchy than, say, protocols, and it's a world apart from any Internet browser. The Browser contains the list of machine names and shares (folders and printers) available for connection. When you click on the little plus sign beside Network Neighborhood in a working Windows 95 setup, you'll occasionally see a few seconds of delay while the Browser is interrogated.

Even in a network that consists of two machines, the process which decides who is the Browse Master is a lot slower than you might expect, and several minutes need to elapse from the machines being started up, the shared drives being published, the local logons being carried out, until there's any browsing activity. Until all this is complete, you won't see the other machine.

This isn't just a parameter issue though: there are fixed delays buried deep inside the system, so deep that no easily accessible setting will speed them up or even disable them. I recently talked about some of the Registry keys concerning routers (and how to avoid NT machines holding the line open), which also happen to be relevant to browsing, but in that instance I was interested in *increasing* the browse interval to once a day, rather than reducing it to a point where a two-machine network could proceed without a hitch.



The Dlink DP-301 pretending to be my answering machine.

The low-level answer to your two-machine network problem is to not browse at all. Right-click on Network Neighborhood and type in the name of the other computer and the share – don't let the Browser go off and find it for you. If your other computer is called *two*, and the share on it's called *share*, you'd enter \\two\share into the Connect To box. This avoids using the Browser to find anything, the connection is made 'speculatively', and you can see the other machine.

However, with these lessons freshly in mind, looking at WinFrame again reveals a much deeper and more disturbing problem. We know that the Browser is where all of the pooled WinFrame user licences go, because the Browser is part of the NT Domain structure and Citrix does like to be tightly integrated with the NT Domain. The Browser and the domain activity take place on a main domain controller, which won't necessarily be the WinFrame server. In really big networks, it's likely to be a fast machine but, because it will also be heavily loaded, this particular problem won't simply go away. My people were being refused connection because the Browser hadn't yet caught up, which meant that their licences weren't being seen.

Once you know all about load balancing and licence pooling, the fix for a single-machine WinFrame setup is relatively easy. The WinFrame licence manager allows each WinFrame machine to pool or unpool its user licences and take the licences out of the pool entirely. Connections that originate from parts of the network that are suffering from compromised Browser periodicity will all start to work again.

### Hub talk

More about Dlink this month. After a considerable struggle with the DI-106 small office hub, I've been playing with two other devices – the DES-5024 24-port hub and 10/100 switch, and the DP-301 10/100-capable external print server unit. This latter box is housed in a very small plastic case with just enough room for power, a parallel cable and an RJ-45 network socket on the back. Its

footprint and the type of plastic the case is made of are both the same as a tiny, solid-state telephone-answering machine I bought for \$60. With the exception of a print server made by Axis, I've never seen such a small device and, judging by the rapid and friendly way in which the DP-301 can be set up (by telnetting into the unit's IP address), I'd hazard a guess that Axis is also responsible for the firmware inside this unit.

Printing is supported via a wide range of protocols, although once you get down to the wire the range becomes curiously limited. LPR printing à la Unix is easy and quick to set up on Windows NT machines, but it isn't supported directly on Windows 95 or 98. Printing via Novell servers is again very straightforward, providing you can remember the tortuous sequence for creating Pservers and queues, and also for letting the server know that a new device is about to come crashing in and grab spooled print jobs.

In time-honoured fashion, I found myself with a dead HP JetDirect card in one of my principal workhorses, and so the DP-301 was unceremoniously grabbed and pressed into temporary service to keep the paper pumping. Substituting it for the JetDirect in the environment, which uses NT LPR to connect networked printers, with Windows 95 clients pointing at the NT print queues directly via IP, took a little under two minutes. Plug it in, hack the standard IP address of the unit to match my somewhat non-standard number range, and then trigger a test print to that address: most of that time was spent walking backwards and forwards from my ThinkPad, on which telnet was running, to the printer.

The DES-5024 is a completely different beast. This is a mini-rack in its own right, with four slots for modular cards and a separate power supply amply endowed with fans. It's the first box I've come across (computers included) to have a noticeably hot fan exhaust. The 5024 is a 24-port switch of a slightly less exotic kind than that found on the Foundry unit I looked at a few months back, but it's an impressive bit of kit all the same. It has two cards of 12 ports each, and any port can run at 10 or 100Mbits independent of any other, with a single slot of the four-slot chassis given over to a management system that takes care of small but important tricks such as subdividing and VLANs.

Subdividing is used to slice up the unit's ports into separate networks, so that the unit looks like several distinct switches that happen to share one box. This proves most useful when a small operation has, say, 16 workstations, a couple of servers and three or four public Internet servers on the other side of a firewall in a Demilitarised Zone. Subdividing

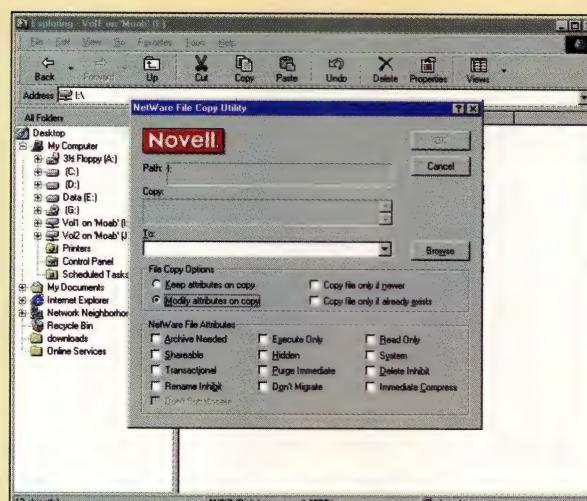
a managed switch like the DES-5024 via the management module means the DMZ machines can be on their own completely separate four-port network.

VLAN mode is used in situations where your network is larger than just one switch, or when you need to move any packet out of one port instead of being selective about the packet's destination (as is the usual configuration with a switch). This will usually crop up when you need two switches because you have 50 devices – then the port on each switch that talks to the other switch needs to be set as a VLAN so that it just forwards packets which later will have further forwarding applied in the target switch.

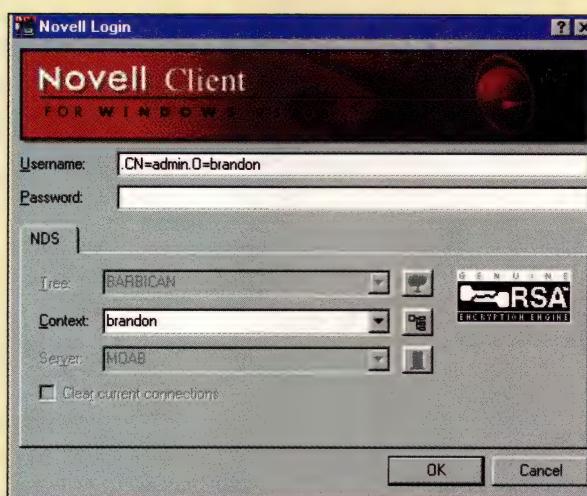
One nice feature of the DES-5024 is its bottom pair of slots that, instead of being full-sized across the whole of the unit, are only half-width. They also take a surprisingly wide variety of add-on modules for talking to things that aren't ordinary Ethernet. At the top end there's a drop-in fibre module with a pair of connectors for making high-speed and long-distance connections between widely separated units, although what really caught my eye was a drop-in ISDN router module. This connects to the DES-5024 via the slot's plug-in backplane and displays on its front nothing more than a nine-way serial port connector and a standard RJ-45 ISDN connector.

I mounted this unit in the DES-5024 with great interest, since on the way in I couldn't help but notice the prominent ZyXEL badges on all of the chips – and, as I suspected, the board is indeed just a ZyXEL Prestige 100 router shorn of its plastic case and connected to Ethernet via the internal backplane in the switch. That's as far as the integration goes: the reason the card has a nine-way serial connector on the front is because it can't talk to the rest of the switch, nor can it be managed through the management port on the chassis – you must unplug from the first port and into the second to get the unit up and running.

Once configured though, the embedded Prestige is visible across the network as a separate IP device and can be manipulated by the Web Configurator program supplied by ZyXEL. However, my review unit suffered to the same degree as the smaller DI-106 in that it was a couple of minor but crucial version revisions behind the firmware used on contemporary ZyXELs, which meant it was unable to connect reliably to my Netcom account. Once router firmware stabilises – which it will, after the introduction of Home



Right-click on a file in the new NetWare server and choose NetWare copy to move files quickly from server to server.



The new NetWare client, complete with unused RSA security, logs into my NetWare 5 network.

Highway and the consequent dash to 128K Channel Bonding – I've no doubt that many sites will see the fully integrated form of the DES-5024 with router module as a godsend, but I can't fully recommend it just yet.

### NetWare hitches

A couple of interesting snippets about the nature of NetWare emerged from a recent wager I made. Much arguing over Windows 98 and the PC98 hardware specification inspired me to dig out a couple of old soldiers in the shape of Compaq 4100s, rejected by their owners for their (hypothetical) Y2K non-compliance. These are DX4/100 machines with PCI Ethernet, IDE controller and VGA card, albeit with 16-bit slots for everything else. I wagered that given enough RAM, these would make perfectly satisfactory Windows 98 machines, and to support the bet I found two 32Mb 72-pin SIMMs, and put the fastest 600Mb disk I could find into one of the 4/100s. After the Windows install had chugged for about an hour, I was left with a

surprisingly usable system. So, equipped with the latest CD-ROM NLM on the NetWare 5 server, I let the standard Novell Client for 95/98 – which comes with NetWare 5 – loose on this ancient retreat. Even when faced with the unusual motherboard Ethernet adaptor, the client installed without a hitch. However, using it was another matter altogether.

Most of my data, which consists of about 1.5Gb of assorted junk, collected utilities, NearSite copies of Web sites and the ghosts of basic machine setups for emergency recoveries, is stored on a single volume that uses the new Novell NSS format and partition scheme. I mentioned last month that, when seen through the Microsoft Novell requester on my HP Brio, this volume occasionally exhibits two copies of whatever is the last folder in the current Explorer window. However, from the fully equipped Windows 98 machine, its behaviour is stranger still, with long filenames that sometimes take it upon themselves to misbehave.

I haven't quite pinned this down yet, but every so often I'm sure I've copied a series of files on the Windows 98 machine which were originally written by the Windows 95, Microsoft requester-equipped Brio, and these have caused the Windows 98 machine to halt, the complaint relating to a file with -1 at the end of its name. This used to be the sign of making a copy from the DOS command line to a NetWare server without the Long Name Support NLMs loaded, but that's not true of NetWare 5 as long names are built into the system, especially on NSS volumes.

It's almost as if the Windows 95 OSR2 NetWare requester is keeping long-named files in a different place to the NetWare requester. However, since the glitch doesn't arise with every file I copy or move, I'm not sure I'm seeing the right error message for the bug. I don't appear to have lost any data as yet, but I have a feeling there'll be a rash of sheepish Knowledge Base articles by the time this reaches print. ☺

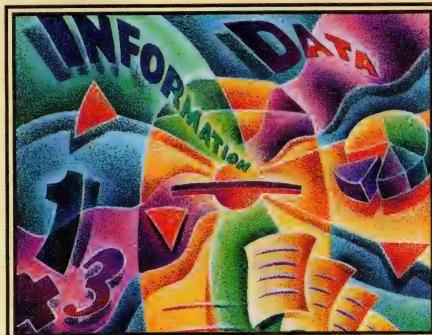
### Steve Cassidy



Can be found pretending he knows what he's doing with networks, from a boat in San Tropez harbour to a heatsink factory in Dallas.

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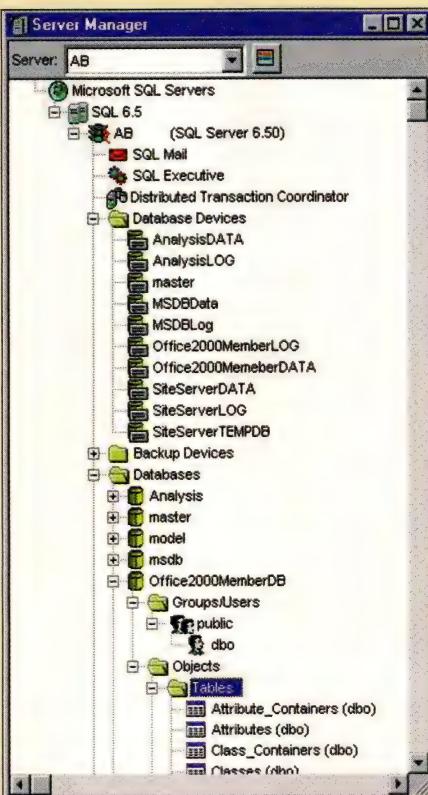
# ACTIVE SERVICE

IT'S NOT TOO EARLY TO LOOK AT WINDOWS 2000'S FORTHCOMING ACTIVE DIRECTORY. DAVID MOSS OFFERS TIPS AND ADVICE.

**A**lthough the Active Directory service of Windows 2000 is still some way off, you can start familiarising yourself with a few of the concepts behind it by using the Membership services of Microsoft Site Server 3. Curiosity piqued, I decided to see for myself just how simple it is to set up, and what benefits and pitfalls await those who decide to take the plunge.

Site Server is, of course, a lot more than just a membership handler. With a feature list that includes content management and publication, channels, usage and content analysis, it's being pushed as the total solution for Web site management. There's no question, though, that its ability to provide secure Web site access and then to personalise the content you see depending on who you are (or what group of people you belong to) is one that will prove very useful on both Internet and intranet sites, and here in the Back Office column we like intranets a lot.

Naturally, Site Server 3 (SS3) is not a standalone product. Or rather it is, but it isn't really, if you see what I mean? Microsoft will tell you that one of SS3's great strengths lies in its interoperability with other Windows NT elements, which is true, but it does mean that you need those elements to be present in the first place – and you probably won't be too staggered to discover that these elements originate from programming teams working in buildings not so very far from the one where the Site Server team hang out. So in reality, to deploy SS3 means you'll need the Microsoft FrontPage 98 Server Extensions, Microsoft Internet Information Server 4 (well, the whole



Administering database components.

of the Windows NT 4 Option Pack, in fact), and Microsoft SQL Server 6.5. Better still, you can use Access, although this introduces restrictions, which I'll come to in a moment.

Before you can even think about personalising a Web site, you must first consider the membership issues – and this is where the fun really starts. How do you intend to authenticate your members as they arrive? In this respect, you basically have three choices: you can use some

form of authentication based around a database; a form of authentication based on the standard Windows NT authentication process, applied to each user created in the User Manager; or you can opt for a hybrid solution that is a combination of both the above. I looked at a standalone database solution and rejected it out of hand, in particular because the security aspects would be hard to handle. You'd need to write reams of server-side code to take care of all the authentication requests, and it would hardly represent a forward-thinking solution, given that Active Directory is just around the corner.

I also rejected the idea of creating a user account in Windows NT for every site member. Yes, there are some advantages to this scheme: for instance, you can have an account for each person and create groups as well. However, the disadvantages outweigh any advantages that might accrue from the built-in Windows NT security system. Let's face it, presumably you'll be expecting a large number of members, or why would you be contemplating the idea of membership? Nor is creating a new Windows NT account for each user a great idea. Strangely enough, it's for precisely this reason you'd want to create Windows NT accounts in the first place; the problem here is one of security, and the more accounts you create, the greater the security problem becomes. All it takes is for you to mess up the permissions for one user (and it will almost certainly be the user you least wanted to mess up on). Also, the NT User Manager doesn't give you a way of easily seeing groups and membership for specific groups – you simply get the whole lot in your face, all the time. Compound that with the chore of creating thousands of individual Windows NT accounts, and you have a total nightmare for

your administrators, whose stress levels will go right through the roof if you intend to employ membership and personalisation on your site as well. The idea of creating Windows NT user accounts for casual visitors to your Web site just isn't worth thinking about.

### Authentication and impersonation

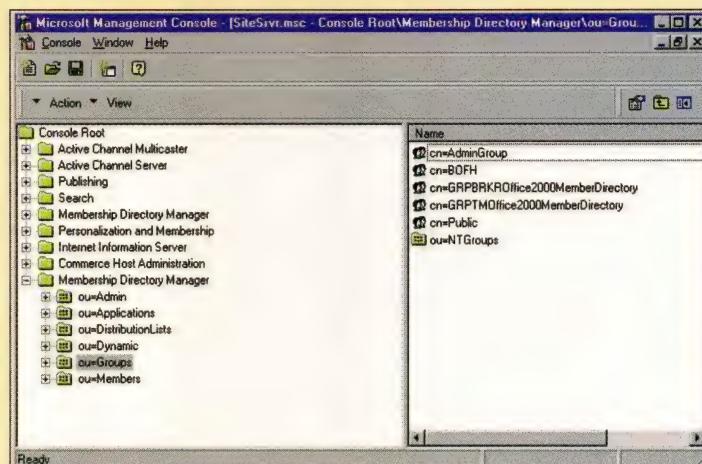
This, however, leaves you with a problem: if you can't use a database on its own, and you can't safely go down the NT User Manager route, what can you do? The answer is to employ the Site Server Membership Directory service, which enables you to create as many member accounts as you like, each one stored within the Membership Directory. What's really neat though is that all those accounts will only need a single-user account in the Windows NT Security Accounts Manager database.

This is basically what Internet Information Server achieves with its single IUSR\_MachineName account, and as a result it means you can nail down security so that it is tighter than, er, a very tight thing – a feat that system administrators will no doubt welcome. Interestingly, having elected to use the Membership Directory, you'll still have a choice as to which authentication method you wish to employ.

The Windows NT account method is still an option here, with some user details being stored in the SAM database and the rest in the Membership Directory, or you can simply head down the Membership Authentication route. This means that all member details will be stored in the Membership Directory, including their passwords (this is the method I've been using, and as yet it's been trouble-free), although there are some steps you should take to ensure tight security before you take live any system which uses this method.

The fact that Membership Authentication employs the single NT user account was one of the factors that persuaded me this was the way to go. The method is called Impersonation, and the default account created is called MemProxyUser. Given that Internet Information Server already provides an IUSR account, you might be wondering why you'd need a second account, especially since IIS and Site Server are as thick as thieves. The reason is that while the IUSR account is perfectly acceptable from a security point of view, users entering the system via that account won't be able to enjoy any personalisation benefits, so it's basically a non-starter.

Having gone for a Membership Authentication scheme, you now have to decide exactly which type of authentication you intend to employ – although with five different authentication methods to choose from, this isn't as easy as it sounds. Taking



Checking on the Groups in the Membership Directory.

them alphabetically, the first is Anonymous Authentication, but I'd already ruled that one out because it demands that you use the IUSR account in IIS. Next is Automatic Cookie Authentication, which is a lot more promising but still not ideal. Each user visiting the site will have a cookie placed on their system, and apart from having a distinct ID number, known as a GUID (globally unique identifier), the user remains anonymous to the system. It is possible to work out a personalisation scheme using this method, but it involves a lot of work.

The third authentication method is one you will have seen many times on Web sites, as it uses an HTML form that prompts you for your username and password. This obviously involves a degree of programming, so you will need to be confident about your skills in programming ASPs (Active Server Pages). This method is often used in conjunction with a cookie and has proved very popular. It can pass the collected user data either in plain text, or encrypted if SSL (Secure Sockets Layer) is in use. Fourth is what is known as Clear Text/Basic Authentication, which is a slightly misleading name because the text strings are actually sent as UUencoded strings, and you can also employ SSL for true security. This method is used on many Web sites and prompts the user to enter their name and password details into a dialog box which pops up when they first access the site.

Last but not least, there's DPA (Distributed Password Authentication). As with the Clear Text/Basic Authentication method, a dialog box is presented to the user to fill out the name and password edit boxes. The dialogs do look different, however, as the DPA dialog is larger and might have an image on the left-hand side. This authentication method works in a very similar way to the NTLM (NT LAN Manager), and it's rather clever too: although you enter your password into the dialog box, it's never actually sent in that form to the server. Instead, a response ID is created, made up of the password

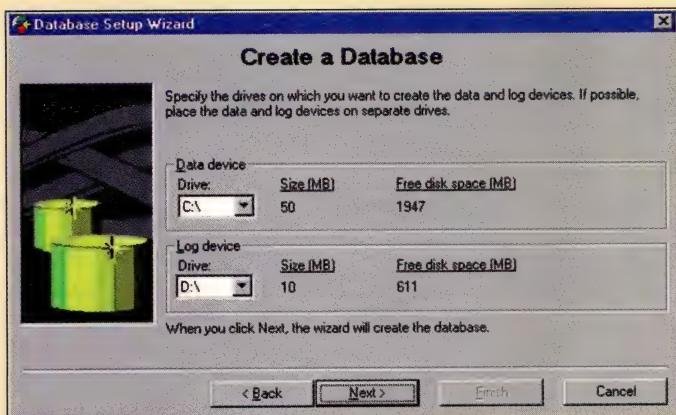
hashed together with a random string supplied by the server when it created the dialog. When the resulting mish-mash arrives at the server, the random string is stripped out of the password, and the system then authenticates the user with the name and password it has just decoded. This is a very secure way of doing things, but

there is a major drawback in that it can't work with anything other than Microsoft Internet Explorer – as far as I know. Certainly, I've never managed to persuade it to display a dialog within any version of Netscape Navigator. Of course, that's not to write it off completely, but it would seem to restrict it to intranet rather than Internet usage.

### Members only

You can use any of the above authentication methods with the Membership Directory – and that's what I'm going to look at next. The Membership Directory is a directory service, which is a fancy way of saying it's the digital equivalent of a phone book or a parts catalog. The advantage, however, is that it can be updated easily, whereas a paper phone book or a parts catalog will need reprinting each time it's updated. Site Server uses LDAP (Lightweight Directory Access Protocol) to talk to the Membership Directory service. As you may know, LDAP is a version of DAP, the protocol created for use with the International Telecom Union's X.500 directory service. LDAP was developed by the University of Michigan in response to calls for a slimmed-down version of DAP that would be easier to work with, and one that would work over the Internet on top of TCP/IP. I always think of LDAP as being to directory services what HTTP is to Web services, the difference being that LDAP talks to directories while HTTP talks to Web servers.

The Membership Directory employs a DIT (Directory Information Tree) to represent the hierarchical structure of the organisation it is to portray, with each level of this tree symbolised by a one- or two-letter prefix. Quite often, a DIT will start with <C> for Country, but more often than not the root of the tree will begin with <O> for Organisation. Beneath this root will be items such as <OU> for Organisational Unit and <CN> for Common Name. If you're familiar with the telecoms world, you may have spotted that these are the naming



Setting up a database is easy using the supplied Wizard.

conventions employed by X.500 directory services, so it is hardly surprising to see them here, as the Membership Directory service has to use a convention that can be understood by LDAP. In some ways, LDAP addresses look very similar to HTTP addresses. For example, a URL such as [www.microsoft.com/ie/ie50](http://www.microsoft.com/ie/ie50) clearly takes you down a tree of Web pages, from [microsoft.com](http://microsoft.com) through the 'ie' level to the 'ie50'. When converted into LDAP format, this route may well look something like:

LDAP://localhost/o=Microsoft/ou=products/ou=internet/cn=ie5

Here's another LDAP address example, this time with a person as the target – it's what you might expect to see when you're looking for someone called Archibald who is a member of the Anorak group:

LDAP://localhost/o=Microsoft/ou=members/ou=anorak/cn=archibald

Okay, so we've established that the Membership Directory speaks LDAP, but as far as Site Server communicating with one using the other is concerned, is that all there is to it? Sadly, no, it's a bit more complex. In fact, Site Server uses a component of Microsoft's ODSI (Open Directory Services Interface) called the ADSI (Active Directory Service Interface) to talk to the Membership Directory using LDAP. Just imagine that ADSI is similar in structure to ODBC, consisting of a set of APIs which it uses to access OLE-DS (OLE-Directory Service) data. The main difference is that it uses LDAP as its communication service, while ODBC most definitely does not.

All of this is wrapped up inside a COM object known as the AUO (Active User Object), and the AUO is the item you get to control programmatically, which is extremely important as it's via the properties, methods and events of this control that you gain access to the user data stored in the Membership Directory.

I mentioned earlier that you could choose between using Access or SQL Server as the data store to hold your Membership Directory. Whichever you decide to use is entirely up to

you, but the SQL Server route offers so many advantages that employing Access just because it is easier to use is not the best solution. Basically, if you don't have any plans for expansion and only ever intend to use one server for everything, you could get away with Access, but if that isn't the case you need SQL Server.

Although this is a rather simplistic analysis, do bear in mind that it's quite possible you'll be storing a great deal of data for each person in your Membership Directory: Access has a 1Gb size limit on its database, whereas SQL Server has none. Also, if you use SQL Server, there's no need for the LDAP service to be running on the same machine – in fact, you could use multiple LDAP services to access the same SQL Server-based Membership Directory. If you use SQL Server, you'll also be able to partition your Membership Directory so that it can be spread across multiple servers – an impossible feat under Access. The only real advantage of Access is that it's dead simple to set up, and there's even a nifty Wizard that will do it all for you.

### What you'll need

Going down the SQL Server road involves a considerable amount of time and effort, and you'll certainly need to know what you're doing. In fact, before you set off down the Site Server/Membership Directory route, you'd be well advised to devote some time to working out just what it is you intend to do. You'll need sound familiarity with IIS 4 and SQL Server 6.5, as well as with the MMC (Microsoft Management Console) way of doing things. You also need to make sure that all the items you'll be using are installed in the correct order: you can't just slap stuff on your Windows NT Server willy-nilly. As a quick guide, you'll need a Windows NT 4 Server with Service Pack 3 at least, and all drives must be NTFS; TCP/IP must be set up on the server; you need Internet Explorer 4.01 installed before you apply the Windows NT 4 Option Pack which will install IIS 4 and the FrontPage 98 server extensions on your system. The server extensions aren't entirely necessary, but if you don't install them, when you come to the next step (the installation of Site Server 3), none of the example Web sites will work – which is a complete pain as there are loads of useful code segments you can rip straight out of these example sites and use in your own. It's always handy to see just what they do before you

decide to use them yourself.

If you're doing all your work on one machine, and SQL Server will be sharing the same machine as Site Server, you should install SQL Server 6.5 and SQL Server Service Pack 4 before you install the NT 4 Option Pack. If you intend to set up SQL Server on a separate machine, you can leave that for now and go straight on to install the Option Pack, after which you get to install Site Server 3, followed by Site Server Commerce Edition (assuming you'll be using that as well). You also need to install the Site Server 3 Service Pack 1. Having done that, you are now free to install SQL Server 7 if appropriate. When you've ticked that lot off your list, it's time to turn your attention to setting up the Membership Directory, the LDAP service, and so on.

Initially, this seems like rather a daunting task, but I started out with a clean system and had an operational SQL Server-based Membership Directory linked to a Web site using DAP authentication in less than a day – and that includes the time it took to install elements of Microsoft Visual Studio 6 (I used Visual InterDev to create the Web site from scratch). What I liked about it was I didn't have to write a single line of code to set it all up. Of course, I had my work cut out in getting all the elements in place and set up properly, but once I'd done that adding users to the Membership Directory was about as easy as it gets, and IIS 4 linked up with the DPA setup to handle all the authentication for me. In my book, no code means less to go wrong, so even though this is a complex solution it's one I feel perfectly comfortable with, and it's definitely one you should be checking out. ☀

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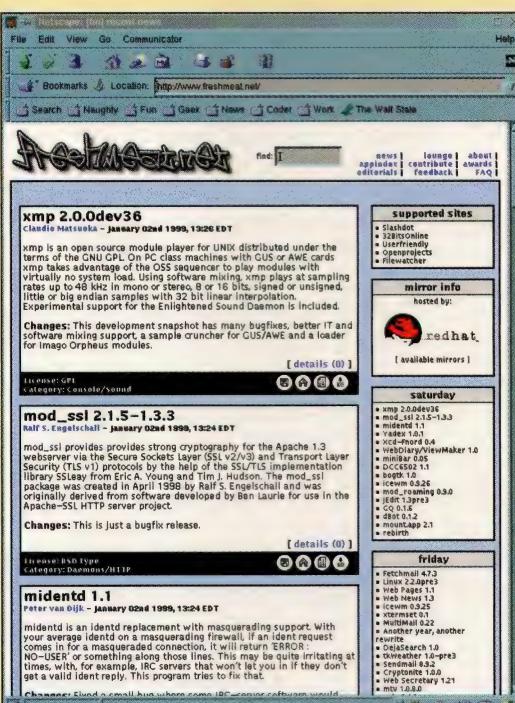


# MEAT'S OFF

DAVID EVNULL PRAISES OPEN SOURCE SOFTWARE, GRAPPLES WITH FETCHMAIL, CRON AND PILOT-LINK, AND FINDS A SENSIBLE SOLUTION TO REMOTE MAIL.

**W**hile putting this column together, my preferred site for tracking down official home pages and latest versions, [www.freshmeat.net](http://www.freshmeat.net), went down for a couple of hours. It wasn't a technical problem but a social one. The site's creator, who goes by the moniker of 'Scoop', had just done a redesign for the new year, and very nice it is too. But on putting it up online, his mailbox filled with flames from people who decided they didn't like the changes – which is rather sad when you consider that he puts up the site without the benefit of sponsorship or advertising. Ego gratification is the sole reward for developers of free software and free information resources, and to be flooded by flame mail after so much hard work is like a psychological sledgehammer. Scoop took [www.freshmeat.net](http://www.freshmeat.net) down, leaving only a brief note as to why, and it was only after receiving more positive mail that he decided to bring the site back online. It's there now, replete with the latest free software releases and a large index of apps and details.

The entire episode, though, highlights the darker side of the free software movement: those who demand yet never contribute. When these folk fail to get what they want, someone somewhere gets flamed, and the flamers justify their behaviour in the same terms that the tabloid press and paparazzi use to justify intruding into people's lives. But what can you do to right this imbalance? Well, as I'll discuss later, you could become a contributor, or at least just remember to drop a thank-you note to



Welcome to the slick new look of Freshmeat.net, which resulted in the instigator being flamed. Rough justice indeed.

the authors when you get a neat new bit of free software. And if you do have criticisms, at least make sure they're constructive. We could all suffer should the good folk who create resources for all of us decide to chuck in the towel.

## Living with Linux

Linux has stealthily established itself in my home office, but not by virtue of its technical superiority or the 'purity' of free software; I just needed a quick way of putting a Web server, mail server and a couple of other bits of digital

plumbing together – and it transpired Linux offered the easiest and cheapest means of doing it. I grabbed a copy of RedHat Linux 5.2 from an ftp server, cut it onto a CD and skipped off home to install it.

The latest version of RedHat Linux is a transitional release, so theoretically, at least, you just drop in the new 2.2 kernel (or a 2.1 development kernel) and away you go. However, I'm saving that pleasure until the screams of those who insist on inhabiting the leading edge of Linux have died down a bit. For now, I just want a quick install, and RedHat 5.2 now offers a choice of very quick installation options, called server/workstation/custom. Choose either of the first two and it will use the entire disk, but it will then sensibly partition it and install the appropriate packages to make a useful server or workstation with the minimum of intervention. The old down-and-dirty installation routine is still available as the custom option if, and only if, you insist on controlling the whole installation process. If, as in my case, you have a blank hard disk and want to spend as little time as possible setting up the system, the new options just reduce the required brain-aerobics.

My server came up with Apache ready to roll, and within ten minutes of rebooting I was hosting Web pages off the system. It's this kind of setup simplicity that Linux boxes such as the Corel NetWinder, Cobalt Qube and others are exploiting. Take a basic lump of network-enabled hardware (in Corel and Cobalt's case, both using RISC processors) add Linux and you have an 'Instant Network Server in a Tin'. Of course, the cynic in me needs to point out that what we're seeing here are new entrants to

the hardware market grabbing a free ride on the back of Linux, as without Linux these boxes would be more expensive and probably not commercially viable. It's all grist to the Linux mill though, and it does emphasise a particular talent of Linux (and Unix in general): namely, running servers. You can check out Corel NetWinder at [www.corelcomputer.com](http://www.corelcomputer.com) and the Cobalt Qube at [www.cobaltmicro.com](http://www.cobaltmicro.com)

Back at my clunkier Intel-based server, I started to sort out my mail problems. I move around a lot nowadays, but all my mail goes to a couple of POP3 mailboxes on a remote firewalled server. So the first problem is that I can't get at my mail, and the second is that if I do get at it I end up with a mailbox split between a couple of machines. This is not a good state of affairs, and it's where the new server comes in. Taking the second problem first: how to get remote but sensible access to my mail? IMAP (Internet Message Access Protocol) was designed with this problem in mind. Like POP, it only really handles the reading of mail (sending of mail still takes place via SMTP), but the difference is that IMAP is designed to allow you to leave your mail on the remote server and manipulate it there. This means that when you open your mailbox, you're not looking at downloaded files but an index of folders and headers on the remote server. Move a message from the inbox into another folder and it's all taken care of at the server end.

IMAP has been steadily creeping onto mail systems for years now, but I was still surprised when I found that RedHat 5.2 was already running an IMAP daemon. To access it, all I had to do was point Netscape Communicator 4.5 at the server and give it my server username and password – and there I was, reading my mailbox remotely. For more gen on IMAP, go to [www imap.org](http://www imap.org), which is an information clearing house. If you haven't got IMAP support on your system, check out the site's IMAP product database as it lists virtually every IMAP-enabled product around.

This was only half the problem, though: I still had to sort out my existing POP3 mailboxes. I didn't want to switch back to receiving mail directly – if anything, I wanted to give the new system a bedding-in period where I could quickly roll back to a working mail system. In the meantime, I wanted to grab that mail and put it into my Unix mailboxes. And there is a tool for this very task, the rather obviously named fetchmail (which just happens to be the project Eric Raymond was working on when he wrote *The Cathedral and the Bazaar*, a key paper on the philosophy of open source software). The concept of fetchmail is simple enough: it pulls mail from wherever it's being queued for delivery and reposts it into the SMTP port of the local system, addressed to a

local user. It's more of an MTA (mail transport agent) than an MDA (mail delivery agent).

Give fetchmail a problem such as a user with multiple POP3 mailboxes, and it takes it in its stride. I have a couple of these mailboxes myself, and at the end of the day I just want to see all my mail in one place. When you run fetchmail, it works its way through a list of mailboxes, logs in to each and grabs the mail. The configuration file is simple enough (see *Listing one*) and uses sentence-style construction. But if you can't handle that, there's a utility called fetchmailconf which gives you a graphical front end for setting up fetchmail, complete with novice and expert modes. However, fetchmail can also handle POP2, RPOP, APOP, KPOP (variations on the theme, some of which add security to the rather vulnerable POP) and all variants of IMAP. You still need to check that your local copy of sendmail can deliver mail to users on the system, otherwise fetchmail's efforts are somewhat wasted.

Since I have a permanently open Internet connection, I wanted fetchmail to fire off regularly, and so initially I popped it under cron, Unix's per user scheduler, but as I'd forgotten to read the relevant manual pages, it proved unsuccessful. As an aside, someone from the 'loud, confident and wrong' community amused me by declaring that Unix cannot schedule jobs to be run at specific times. Cron is a long-established Unix utility which does all the scheduling you could want. There are graphical front ends for it, but to set it up simply means creating a file where each line specifies a time and a command to run. The time must be supplied in the format minutes, hours, day of month, month, and day of week. So, say you want to run foobar every hour, you'd put '0 \* \* \* \* foobar' into your crontab file. If you wanted it on the hour and half-hour on Sundays, the line would be

## Code

### Listing one

```
set postmaster "evnnull"
poll popper.host.net with proto POP3
  user "evnnull" there with
  password "shala10t" is evnnull here
  user "info" there with
  password "sche3e" is evnnull here
  poll qsote.host.net with proto POP3
    user "abuse" there with
    password "temp" is root here
```

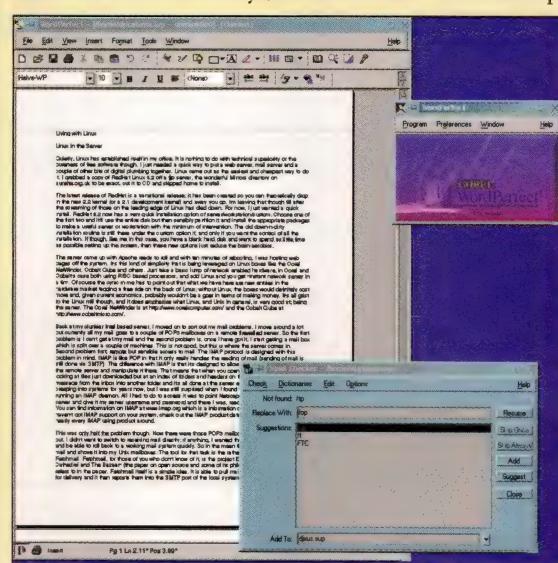
'0,30 \* \* \* 0 foobar'. When you've created a file with the time entries, issue the crontab command to lodge the file in the system for processing (crontab will also list those entries you have currently lodged, by typing 'crontab -l'). Check out cron using 'man cron', 'man crontab' and 'man 5 crontab' to get relevant man pages, or go to the tutorial at <http://usats.com/learn/crontab.shtml>

Back to fetchmail, though. What I'd missed was to add a '-d', aka the daemon flag, which lets fetchmail hide and only wake up at a set number of seconds to retrieve the mail. If you've got a dial-up connection, it's more practical to make fetchmail the first program you run after establishing a connection. Among the non-standard mail systems that fetchmail can handle is Demon Internet's 'single POP3 for many users' system, as fetchmail can read off the extra data that Demon adds to the mail lines and drop the mail into the correct mailbox locally. Fetchmail is at [www.tuxedo.org/~esr/fetchmail/](http://www.tuxedo.org/~esr/fetchmail/) where you'll also find an excellent FAQ and more.

### Linux on the desktop

Given the amount of server setting up I'd taken on, I decided to reinstall my Linux desktop. First, I had to get my hands on KDE

1.1 pre-release, which is a good consolidation and clean-up of KDE and is easier to install. It has lots of added features which don't break the overall look and feel. My next task was to get a decent word processor up and running. As Star Division and Corel have both released what I call 'puffware' (personal-use-for-free, pay for commercial use) versions of StarOffice and WordPerfect 8, I downloaded them both and many hours later I finally got to work. The WordPerfect 8 release has had a lot of time spent on it, and I've been using it quite a bit and it hasn't crashed yet (something that can't be said about StarOffice). In mitigation, StarOffice is a far more ambitious product, but since I



Looking good for your money – you can now download a stripped-down version of WordPerfect 8 for free.

tend to use my word processor more than any other program my priority was safety – hence WordPerfect 8.

I've worked with WordPerfect in its various Unix guises, and this version has to be the most together so far. The downloadable puffware version misses out on fonts and doesn't support 'express docs' (WordPerfect's own Wizards) or the creation of pictures. If you must have those features, there's a \$US50 CD from Corel which comes with Netscape 3.02 (why?), 130 fonts, lots of clip-art, textures and photos, and the features enabled in the program itself – and there's even a manual too. This also frees you from the personal-use-only restriction of the downloadable version. If all you need is a functional word mangler, the puffware version will suffice, assuming you can stay within the tight personal use definition. If you need more though, the commercial version is reasonably priced.

As regular readers will know, I'm a Palm-Pilot fan, and so getting the Pilot to work with Linux on the desktop was essential if I was going to maintain a Linux desktop. A lot of work has been done on Pilot integration, and the core of it is a package called pilot-link, which is a bundle of programs that give you different ways of interacting with a Pilot sitting in its HotSync cradle. These range from simple Pilot backup to libraries that allow C++, Java, Python, Tcl and Perl scripts to manipulate the Pilot's contents. Some programs just transfer a single file to the Pilot, or convert Pilot memos to make them into mail, and much more. These programs are all, in best Unix tradition, command-line driven and ready to be incorporated into scripts or used by graphical applications.

Irritatingly, there is no apparent home page for pilot-link, and you'll find it scattered all over the place. This is one of those occasions

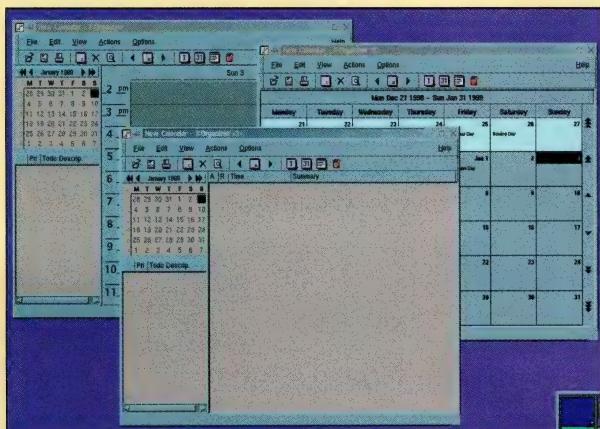


No problem – we can sync it for you wholesale, courtesy of Kpilot on Linux.

when the open source model nearly breaks down, as without a definitive home there's no-one harnessing the efforts of different developers around the world, and in turn the development doesn't feel like it has any real forward direction. There's no easy way to bring on new developers because apart from some email addresses if they're lucky, they don't know where to start. What these community coding efforts need are virtual administrators, people who take on the load of creating and publicising Web sites for existing open source product. On the other hand, the last thing the movement needs are administrators who open a Web page with lofty project goals, announcing that this project is the future and, just as soon as they find a programmer, well, just you watch out! There are already too many pages of projects that never happened out there on the Net.

The practical upshot of this? Even if you're not a programmer, but are computer literate, why not volunteer some time to whichever open source software you use? Write a beginner's or reference guide, pull together hints and tips, and if there isn't a Web page ask the active developers if you can help. You don't have to cut C code with your bare hands to be useful.

Back to pilot-link, though. On KDE there is a front end called Kpilot, a separate development which uses pilot-link for far easier synchronisation and tries to behave in a similar way to the Windows Pilot Desktop software. It puts a HotSync icon in the Panel Tray so that pressing the cradle's HotSync button kicks off synchronisation. The actual Kpilot client is quite simplistic and nowhere near as slick as



Making a date under KDE with KOrganiser.

the official 3Com Windows software, but it handles the essentials and that's what counts. Kpilot implements several conduits for data to be exchanged with other applications, but the list is short. What's missing though is KOrganiser, which is moving into the core of KDE as a standard part of the desktop. KOrganiser would be ideal as a more advanced synchronisation client if someone would only produce a conduit for it, but until then the simple address/memo viewing and file installing of Kpilot will suffice. You can find Kpilot at [www.slac.com/pilone/kpilot\\_home/mainpage.html](http://www.slac.com/pilone/kpilot_home/mainpage.html) – it is there that you'll also find pilot-link (and if anyone finds an official home page for it, let me know!).

### MicroJava

I'm almost out of space to talk about things Java. I've been tied up with the release version of Java 2, as what was JDK 1.2 has been folded into a newly badged Java 2. It's all looking pretty good, but it does seem to show symptoms of being a rushed release, so I'm working my way through it to ensure it's up to scratch. That means the 'Applets that are Applications' stuff will be put off until next month too. There are a couple of queries in mail, though, which need answering before I leave...

If you're looking for the source of the Java Linux ports, it's [www.blackdown.org/java-linux.html](http://www.blackdown.org/java-linux.html), which is where you'll find the Linux Java 2/JDK 1.2 when it's released. You don't need Motif for Linux to run the JDK on Linux. MetroLink helped out the Blackdown folks so you'll find Motif is statically linked in (but if you have a Motif toolkit, you can use a dynamically-linked version for a bit more startup speed).

Another query that came my way concerned pure Java Webservers, and whether there are any definitive ones. The W3C development server, Jigsaw, is about as definitive as you can get as it's using that to refine new W3C specifications. It fully supports HTTP1.1, for example, and can also run as a proxy server for HTTP1.1. The version 2 release of Jigsaw is now a reality and incorporates Servlets and more. Find it at [www.w3.org/Jigsaw/](http://www.w3.org/Jigsaw/) as an open source project with a GPL-compatible (but not GPL) licence, so you can redevelop the work yourself. ☺

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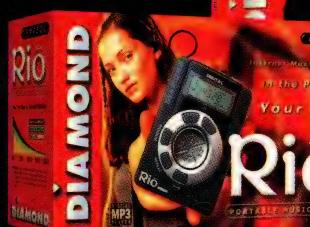
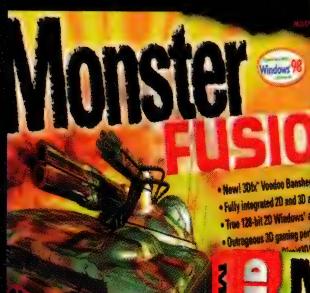
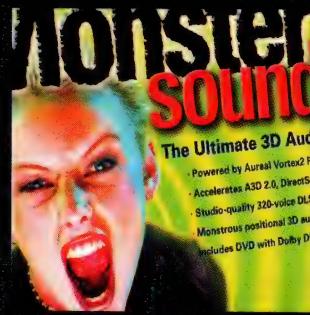
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\*PC MAGAZINE EDITOR'S CHOICE - NOVEMBER, 1998 MONSTER FUSION. \*\*PC AUTHORITY RECOMMENDED AWARD - VIPER V550 - NOVEMBER & DECEMBER 1998.



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# GAME RESERVE

This month we have a bumper crop of games, from the snowy reaches of *South Park*, to the steamy depths of Hell. Sounds like fun.

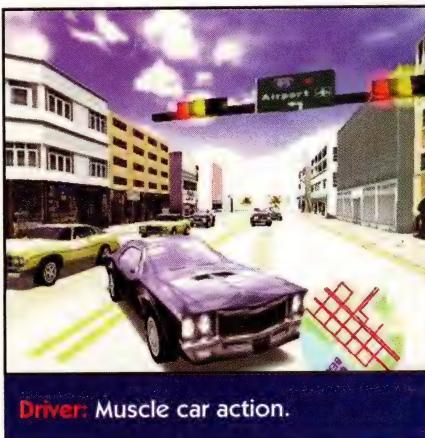
## NEWS

### NOW VOYAGER

Raven Software has recently acquired, via its parent company Activision, the game development rights to the *Star Trek: Voyager* franchise. The design house is looking to release a first person shooter (what else?), that features strong single player versatility, but whose greatest strength is in co-operative multiplayer, with the players putting on mustard shirts to join the Voyager's security team. The deal has only recently been made, and the design phase only just begun, but a demo should be available around May.

### JUST LIKE STEVE

I've always been a big fan of the movie *Bullitt*. In the film, Steve McQueen plays a



**Driver:** Muscle car action.

cool and collected cop, and it also features arguably the best car chase ever filmed - over and around the hilly streets of San Francisco. If this is your kind of dream vocation, then the upcoming car sim *Driver* is what you've been waiting for. Drive around in ten of the most popular muscle cars of the sixties, as an undercover cop, or driving getaway cars for the mob.

And I won't even need a driver's license for all that mayhem!

### PEN AND PAPER REVOLUTION

Pen and paper games are enjoying a lot of



**Vampire - The Masquerade:** Dark and brooding action from White Wolf.

popularity amongst computer game designers at the moment. *Baldur's Gate* is an obvious example, but so are a number of other upcoming titles.

Two games based upon roleplaying company White Wolf's popular *World of Darkness* are *The Heart of Gaia* and *The Masquerade*. The latest cross over from dice and lead is the successful *Silent Death* franchise, a game of starship combat in the far future. Expect a title from multiplayer experts Kesmai in the near future.

[www.gamestorm.com](http://www.gamestorm.com)

### ULTIMATE AUCTION

Online auction house eBay has recently seen the birth of a new online commodity. It's not pre-configured games PCs, or old luxury cars



driven around by Quake designer John Carmack, but Ultima Online accounts.

Ultima has long been quite a gaming phenomenon, offering its players a vast virtual fantasy world to populate and explore. Getting good, and accumulating wealth and power, can take some time however, and that's why one player by the name of Turbohawk decided to auction his established and somewhat rich character - and finally sold it for \$US521. The floodgates now open, other players started auctioning off their accounts.

Players have often sold or traded their accounts, but auctioning them means a feeding frenzy that drives prices into the heavens; the highest price so far is in excess of \$US1,500. It's a great way to get a head start in a popular game, but it is still only a game.

[www.ebay.com](http://www.ebay.com)

### MAC SERIOUS ABOUT GAMES

Intent on showing its commitment to the Mac as a games platform, Apple has announced that users purchasing the new OS will receive, for free, a copy of either *Tomb Raider Gold* or *Tomb Raider II*. If Lara Croft isn't incentive enough for gamers to consider the Mac as a true alternative, then nothing is.

[www.apple.com](http://www.apple.com)

### TOKEN MONOPOLY

While it may not be strictly computer related, I believe that this news is of such import that it must be reported. *Monopoly*, arguably the most popular of board games, will soon be graced with a new token. A bi-plane, a bag of cash or a piggy bank will join the Scotty Dog, Top Hat, Battleship and other familiar tokens. The three finalists were decided by a national American election.

Now that's what I call democracy.

YOUR NAME IS "MALACHI."  
THAT'S ANCIENT HEBREW FOR  
**BAD ASS MOTHER**



# REQUIEM

AVENGING ANGEL™



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## ASGHAN: THE DRAGON SLAYER

**B**illing itself as a swords and sorcery adventure inspired by J. R. R. Tolkien, Asghan is a fairly simple Tomb Raider clone. Using a third person viewpoint, your character must slice and dice his way through around 30 levels of monsters and traps, defeat dragons and avenge his father.

The story is developed through encounters with allies such as Fiona the Fairy, who provides vital tips on what is ahead. A nice feature is that all of these conversations, and the messages that can be collected in certain areas, are all automatically stored in a journal for later reference.

Your character has around ten different sword moves, a crossbow with a sniper sight, and can eventually gain the ability to cast a dozen or so magic spells. Players have full motion in 3D, with swimming, climbing, diverolls and swinging hand-over-hand across ropes all catered for, as well as the usual jumping, crouching and sidestepping moves. Unfortunately, much of the game takes place on narrow walkways or in small rooms, so there is rarely the space to truly appreciate the range of movement. The combat model is poor, subtracting

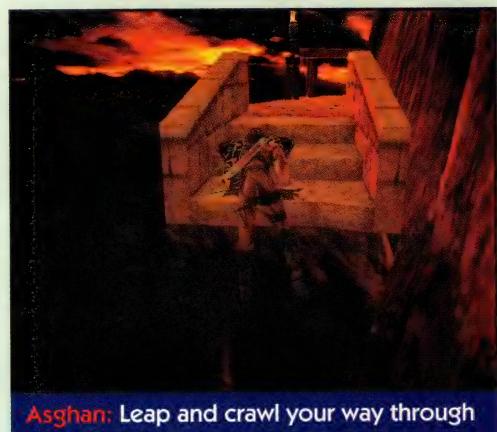
even more from the game - most battles turn into a simple hack 'n' slash until someone falls down.

Magic becomes necessary towards the end of the game, and while it is primarily a combat tool, a few spells are used for finding secret paths or sneaking past guards. Magic must be mixed from various components and it is important to keep a reserve pre-prepared, as there are few locations for making more. Again, the journal stores details of spells as they are learnt for easy retrieval.

Asghan has a number of other problems too. The 3D engine is somewhat clumsy, with frequent collision errors such as becoming stuck in a wall or cliff. The controls are difficult to use, and while the manual says they can be customised, this isn't true on installation. Sound settings are also quirky, music is either on or off despite a volume slide. In order to hear tips from characters, the music had to be turned off altogether. Even once you can hear the other characters, the voice acting itself is quite poor, with Fiona's poetry and monotones particularly bad.



Asghan: Still images don't convey how clumsy the 3D engine is.



Asghan: Leap and crawl your way through countless fantasy environments.

The storyline is very thin - certainly not up to an adventure story. Gameplay is repetitive despite some beautifully crafted areas, and the monster AI is limited to attacking on sight, with monsters blithely standing by as their fellows are crossbowed down. Given the great range of action PC titles available right now, Asghan is sadly several years behind its time.

Jacinta Thomler

### Overall Score 8000

**Requirements** Pentium 200, 32Mb of RAM, 20Mb of disk space, Quad-speed CD-Rom, Windows 95/98, 3D card preferred.

**Price** \$89.95

**Gremlin** (03) 9879 3588

 [www.gremlin.com](http://www.gremlin.com)

## REQUIEM - AVENGING ANGEL

**R**equiem, from 3DO, is one of those first person shooters which likes to think that it is different. Nearly all games make this claim upon release, but not many can live up to the promise. Although the build of Requiem that I played was still a beta and obviously well short of being shipped, I think that the current reigning champion of shoot-em-ups, Half-Life, has little to fear.

The game boasts a strong plot based upon a raging war between Heaven and Hell, between the fallen angels lead by Lilith, Adam's much maligned first wife, and your own faction still loyal to the word of God. The fighting has spilled over into Creation, and Lilith is threatening all humanity with a plot to take over a large starship in orbit and power the thing with human souls. The part you play in this war of good and evil is of the avenging angel Malachi. Unfortunately, the only real impact this has on gameplay is that as you progress through the game you develop greater angelic powers. These really just feel like other

weapons or power ups, and it is just as useful to kill someone with an assault rifle as it is to mow them down with holy fire.

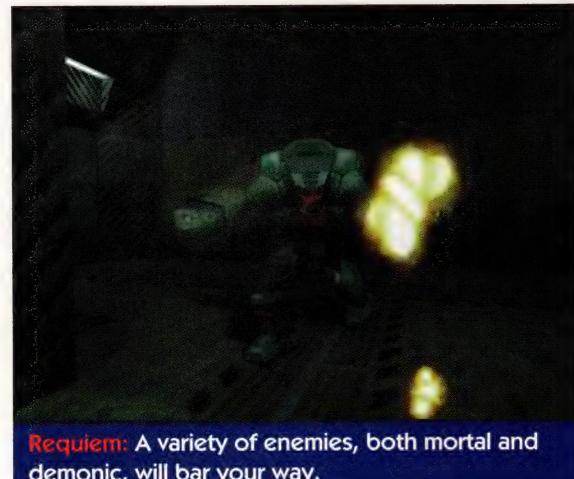
Level design is quite good offering a variety of environments from dusty streets and rebel hideouts to the depths of Hell and the reaches of outer space. The game's 3D engine handles colour quite nicely, avoiding the barren green and brown palette of Quake, as well as featuring some very nice light sourcing alongside some of the heavier weapons and angelic powers. The AI is likewise solid, but not a patch upon the GIs of Half-Life; it is

challenging though, and your foes are quite capable of dealing a lot of hurt your way.

One of the game's real strengths, even at this beta stage, is the fluid character animation. The people who populate the cities and hells of Requiem have up to 500 polygons a piece, and run and leap around quite convincingly - a



Requiem: The environs of Hell are not a friendly place.



Requiem: A variety of enemies, both mortal and demonic, will bar your way.

special treat is watching your enemies do the chaingun cha-cha, writhing about and finally collapsing in a host of gruesome ways.

Ultimately, Requiem: Avenging Angel has a lot to live up to. It has already suffered a long delay in its shipping time, and does not feature enough groundbreaking gameplay to warrant its late arrival on the shelves. That aside, it is still a fun diversion, and the polished product will no doubt offer a satisfying, and righteous, 3D experience. The official demo is available for download at 3DO's Web site ([www.3do.com/requiem](http://www.3do.com/requiem)) and the full game should be available soon.

David Hollingworth

## FALCON 4

**A**rguably the most anticipated flight sim release to date, Falcon 4 has finally hit the shelves. Following on from Falcon 3, Falcon 4 is a highly ambitious project developed over four years, and brings to the PC an unprecedented level of complexity and authenticity in flight simulation, giving gamers an ultra-realistic impression of modern aerial combat.

Falcon 4 models the Block 50/52 F-16C, with AN/APG 68 radar in fine detail, omitting only what is still classified. Flying over an accurately contoured virtual Korea, the terrain looks outstanding, complimented by an intense sound environment. The physics model is also realistic, although if you find it a little overwhelming, there are adjustable skill levels offering simplified radar and flight models as well as variable AI.



Play options offer a choice between Instant Action, Dogfight, Tactical Engagement and Campaign modes. Instant Action speaks for itself. Dogfight offers variations on the 'furball' theme, with excellent multiplayer capabilities. Tactical Engagement contains 31 training missions designed by an actual F-16 pilot and explained in the tome-like but very readable manual. It also doubles as a detailed mission builder. Falcon 4 features a fully dynamic campaign engine, simulating the entire battlefield and the way in which mission planning and execution is conducted in a real-life war situation. Multiplayer is also available with both Tactical Engagement and the Campaign, however without a gamefinder or a dedicated multiplayer server it is quite difficult to co-ordinate a game.

The Campaign and Tactical Engagement interface can be difficult to manage, especially when utilising map options. The game does have incredible depth but unlike Falcon 3,

squadron management is somewhat limited, making it difficult to develop a sense of team or impart a feeling of loss when your favourite pilot is KIA, an element of gameplay that Falcon 3 captured so well.

Given its groundbreaking complexity and realism Falcon 4 deserves to be the best, but is seriously hampered by a multitude of bugs that effect nearly every aspect of the game.

Problems exist with AI, communications and



**Falcon 4:** Pilots have a lot of information to digest in briefings.

## TOP GUN – HORNET'S NEST

**T**op Gun – Hornet's Nest is the second flying game to be based on the Top Gun movie. The first release was well received because its FMV-driven plot line worked reasonably well, or it at least surpassed other interactive movies available at the time.

Fortunately, the world has moved on since the dark days of FMV-based games. However, starting up Hornet's Nest for the first time and watching the cheesy opening scene complete with C-list actors spouting clichés by the dozen brought all the awful memories flooding back.

Having endured the video scenes, the game proper puts you at the controls of an FA-18 Hornet, hence the title. But this is definitely a game, not a flight simulation. The manual does go into some detail about the theory of flight, dogfighting tactics and the like, but once in the cockpit any sense of realism quickly disappears.

The cockpit presents you with a left and

right Multiple Function Display and a magic central monitor screen that can show you a view of your target and what's going on around you at all times. You can't look down to see any other instruments – all other information is limited to the Heads Up Display.

Of course, I've never flown an FA-18, but the flight model doesn't seem very accurate. It's almost impossible to stall the aircraft or black out. Acquiring a missile lock on a target demands only that you be in its vague vicinity, and the 'Shoot' cue appears without you even having to arm your weapons. If the US Navy's missiles were as accurate as those fitted to your Hornet, no-one would bother trying to attack a US fighter.

The game's graphics engine is reasonable if you have a fast machine and choose to install the detailed textures from the three sets available. The all-important lens flare is present, but by today's standards the look of the game is unremarkable.

If you're looking for a decent simulation of the Hornet, get a copy of Empire's FA-18 Korea. And if you want an exciting, plot-driven action game, go and buy Half-Life. This kind of game just doesn't cut the mustard any more.

David Fearon

### Overall Score

**Requirements** Pentium/200, 32Mb of RAM, 255Mb of hard disk space, 3D graphics accelerator recommended.

**Price** \$69.95

**MicroProse** (02) 9953 8788

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**Top Gun:** A sad reminder of the bad old days of gaming.

multiplayer, as well as frequent lock-ups and crashes. Combined with a drastic loss of frame-rate in overactive campaigns, it's all indicative of a prematurely released product. Unfortunately playing Falcon 4 is like being a beta-tester. The game is also extremely CPU intensive, and although it's possible to play in software mode on a Pentium/166 it is highly recommended that you have a Pentium II with 3D acceleration. Falcon 4 has already had two patch updates with a third pending (v1.05).



**Falcon 4:** Brilliant 3D graphics but flawed gameplay.

You should check the Falcon 4 Web site frequently for the latest news and updates. Provided the bugs are fixed, this immensely detailed and comprehensive simulation of modern fighter combat would rate six stars.

*Ashok Zaman*

### Overall Score

**Requirements** Pentium/166, 32Mb of RAM, quad-speed CD-ROM, 175Mb of hard disk space, Windows 95/98 with DirectX 5 or better, 16 bit high colour graphics, DirectX compatible sound card and joystick, 3D accelerator highly recommended.

**Price** \$89.95

**Microprose** (02) 99538788

[www.falcon4.com](http://www.falcon4.com)

## SIMCITY 3000

The first two SimCity games were widely lauded as being among the most complex and addictive games ever. SimCity 3000 continues the trend in true Maxis style by introducing new elements while maintaining the crucial edge that keeps you coming back for more. The game concept is surprisingly simple: as the mayor, you need to build, manage and develop a whole city.

Experienced SimCity players will find SimCity 3000 both familiar and friendly. However, it's worth playing through one of the tutorial scenarios to familiarise yourself with the changes and new features. As the game is a native Windows application,



**SimCity 3000:** Familiar enough to be fun, but lacking in innovation.

there's now no fussing around with graphics drivers in order for it to run at a decent resolution.

Once you get round to creating your city, a number of changes soon become apparent. Instead of the newspaper screens which graced its predecessors, a news ticker scrolls along the bottom to keep you up to date with city developments; you can also click on most of these messages for further details. Two totally new developments are the management of rubbish and pollution as you now have to zone landfill sites to clear rubbish from the streets, and you also need to minimise pollution. Also welcome is the greater interaction with neighbouring cities, be it buying or selling excess electricity, water or landfill space.

Existing gameplay features have been enhanced too, as you can now zone areas in up to three depths (rather than two), and there are more transport, power and water options. Not only that, but there are four zoom levels which enable you to see as much or as little of your city as you wish.

Graphically, SimCity 3000 is not a million miles away from SimCity 2000, although there is a wider variety of buildings. In addition, you can now customise your city to a much greater extent with specific landmarks from around the world. And, as before, you can choose to play various historical scenarios where it's up to you to test your management skills and avert a crisis.

Ultimately, though, SimCity 3000 is a little disappointing as it feels much more like an upgrade than a ground-up revamp. There are some welcome new features that certainly enhance the sense of realism, but it's a shame you can't move around your city in true 3D to gain a new perspective on problems.

*James Gorbold*

**Overall Score**

**Requirements** Pentium/166, 32Mb of RAM, 270Mb of hard disk space.

**Price** \$89.95

**Electronic Arts** (07) 5561 2828

[www.ea.com](http://www.ea.com)

## SOUTH PARK

**S**outh Park the game has turned the infamous cartoon series into an interactive menagerie of madness, and left nothing to the imagination. This is South Park, Quake-style. It's a twisted, first person shooter with attitude, and features one of the funniest multiplayer games going, a great way to liven up any computer party.

All of the best known and most often



**South Park:** A variety of strange weapons allow mayhem in undreamt of ways.

repeated lines from the TV series are scattered throughout the game, while all of the characters, along with their special idiosyncrasies, make appearances at some stage or other. Even in single player mode it's difficult to play it with a straight face.

Aliens are invading the town and the local

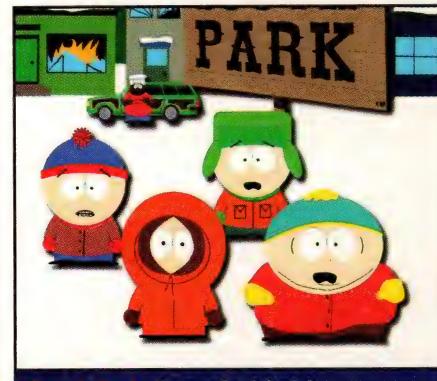
wildlife is going loco. It's up to Kenny, Kyle, Stan and Cartman to save the town from the terror of stampeding turkeys, the misery of mad cows, the ravages of redneck zombies, and a host of other horrors.

With only Cheesy Poofs and a few other snacks to keep their energy up, the boys have to fight their way through level after level of mayhem, building up an arsenal of interesting weapons as they go.

Beginning with nothing more than rapid-fire snowballs, you eventually collect enough devices to make any mad scientist happy. They range from toilet plungers and Terrance and Phillip fart dolls, to chicken sniper rifles and a strange device that makes aliens dance. There is even a cow-launching bazooka.

While the foursome are making war against the aliens, Chef is in his love shack making the most of what little time appears to be remaining before the world ends. However, he does occasionally get himself out of bed long enough to help the boys with some essential advice between levels.

The multiplayer mode unlocks 20 of the best known South Park characters - even Mr Hanky the Christmas poo makes an appearance - so you are not restricted to running around as the four boys. The purists, who love South Park the cartoon because of its 2D graphics, will be disappointed to learn



**South Park:** Son of a bitch!

the game is actually 3D, but for anybody else it just adds to the experience.

South Park has a huge cult following and the game will be subject to close scrutiny. Acclaim has done a good job in sticking as close to the TV series as possible and thankfully did not succumb to any temptation to tone things down. As a result it has come up with a fun and funny game that has good graphics, madcap gameplay and a sick sense of humour - just like the TV show.

*David Hellaby*

**Overall Score**

**Requirements** Pentium/II 266, 32Mb of RAM, quad-speed CD-ROM.

**Price** \$89.95

**Acclaim** (02) 9380 4500

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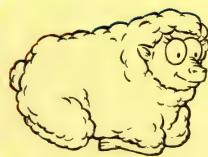
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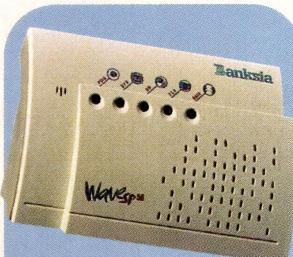
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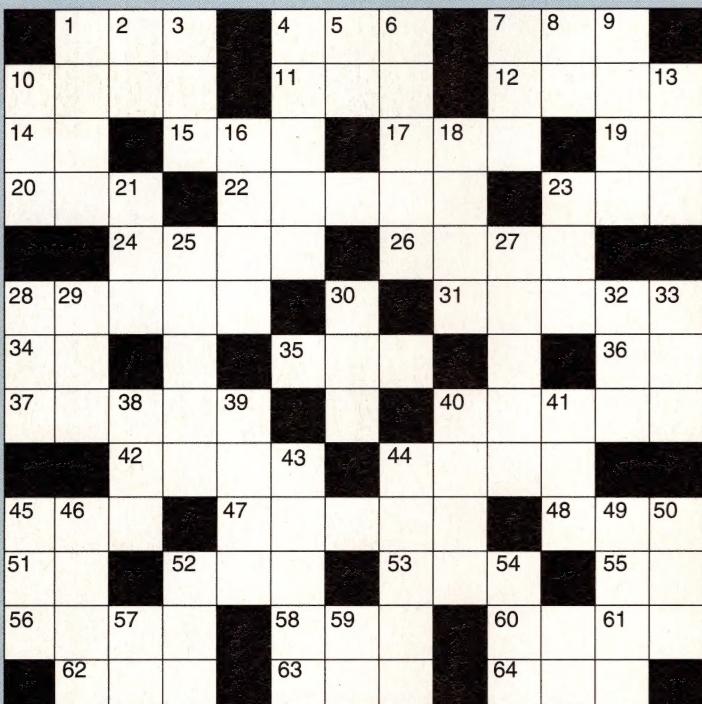
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## Across

- Factor of 12 across
- 23 across minus fifty-four
- 11 across plus 34 across minus 18
- 60 across plus 8 down minus 10
- 2 down times five
- 40 down plus 16 down plus 351
- 2 down minus 43
- 21 down plus 52 down plus 3
- 7 down minus 50
- Factor of 1 across
- 58 across plus 1 4 across plus 7
- 43 down plus 62 across minus 2164
- 56 across divided by eleven
- 39 down plus 50 down minus 326
- 40 down minus 199
- 6 down minus 1431
- 37 across plus 38 down minus 9539
- 41 down divided by six
- Factor of 12 across
- Factor of 28 down
- 44 down plus 47 across minus 2989
- 27 down plus 6647
- Multiple of 3 down
- 24 across plus 42 across minus 336
- 16 down divided by 7
- Twelve times 16 down
- 12 across divided by 14
- A prime number
- Three times 51 across
- 52 across minus fifteen
- A prime number
- Eleven times 54 down
- 23 down plus 57 down minus 24
- 46 down minus 583
- 64 across plus 11 across minus 9
- Multiple of 36 across
- 53 across plus 59 down plus 11

## Down

- 16 down plus 159
- A prime number
- 13 down plus 63 across plus thirty
- Four times 27 down
- 55 across minus 24
- 63 across times 45 down
- 30 down minus 48
- 55 across minus 22
- 39 down minus 215
- A square number
- 1 across minus 83
- 40 down plus 33 down plus 39
- Two times 15 across
- 7 across plus 32 down minus 32
- Factor of 12 across
- 55 across times 41 down
- 25 down plus 4
- 10 down plus 69
- 48 across minus 24
- 29 down plus 61 down plus 11
- A square number
- A square number
- 35 across minus 96
- 18 down plus 19 across minus 154
- Five times 41 down
- 33 down plus 35
- 47 across minus 191
- Eighteen times 26 across
- 45 across plus 5 down minus 47
- 44 across plus 16 down minus 52
- 19 across minus 177
- 4 across plus 55
- 52 across minus twelve
- 5 down times 2 down
- Two times 51 across
- 5 down plus sixty-three
- 34 across minus thirty-five

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Issue 16 solution



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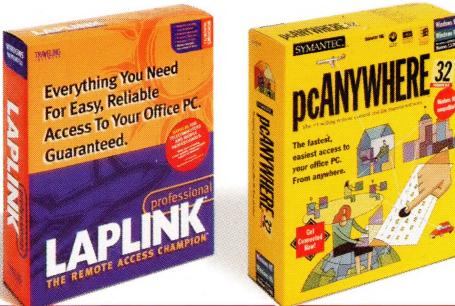
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